

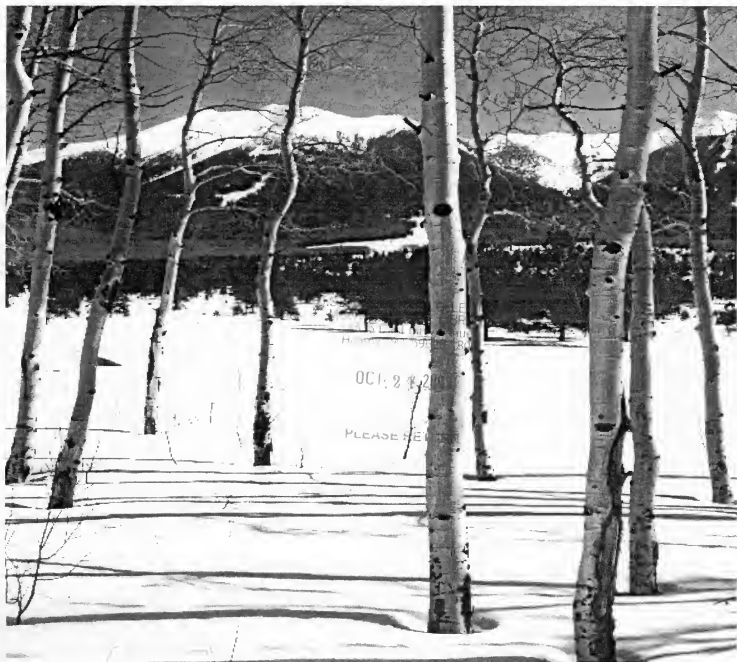
Natural  
Resources  
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Service

s  
of

Montana

Basin Outlook Report

April 1, 1998



Montana State Library



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# Basin Outlook Reports

## and

### Federal - State - Private

### Cooperative Snow Surveys

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*For more water supply and resource management information, contact:*  
**See Attached List**

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#### *How forecasts are made*

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

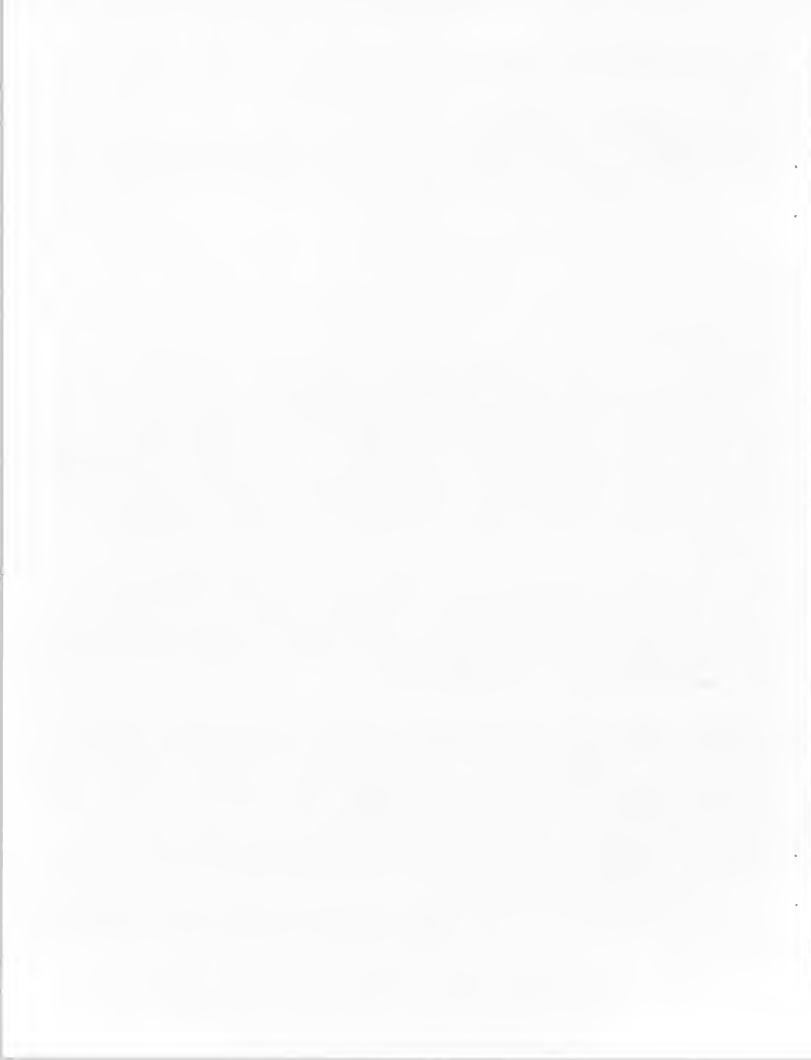
Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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United States Department of Agriculture  
Natural Resources Conservation Service (formerly the Soil Conservation Service)  
Bozeman, Montana

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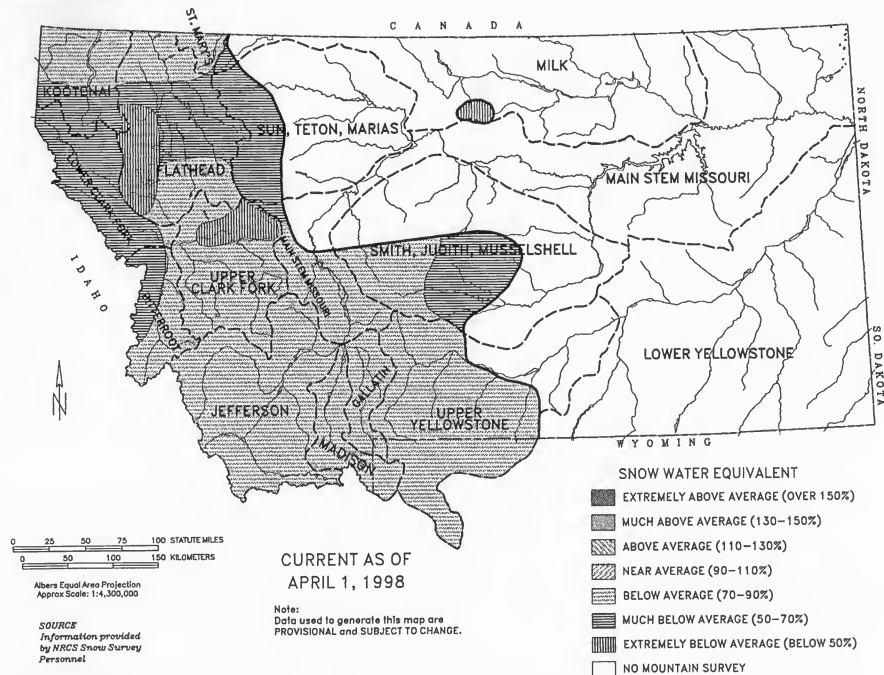
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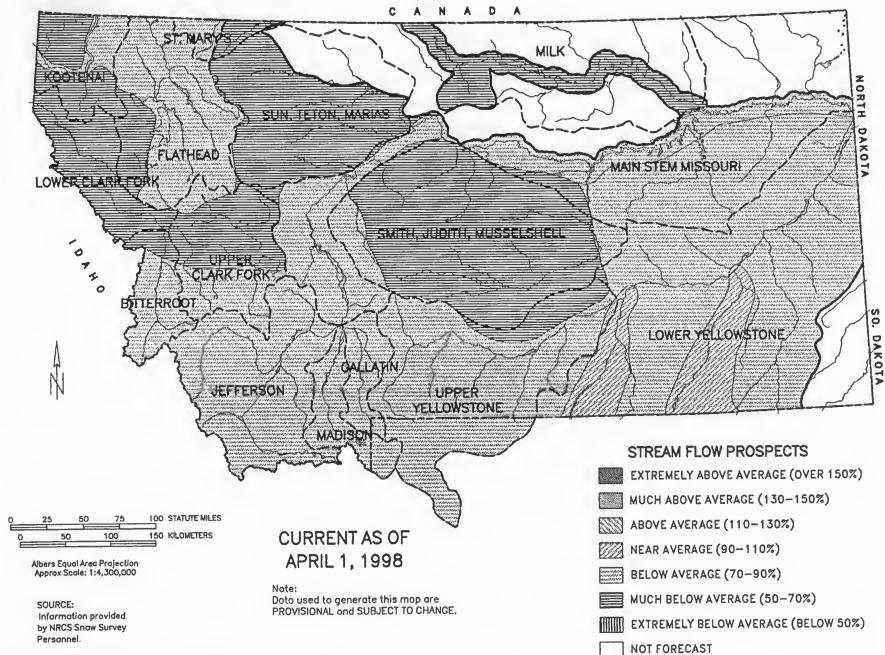
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Shad Weber  
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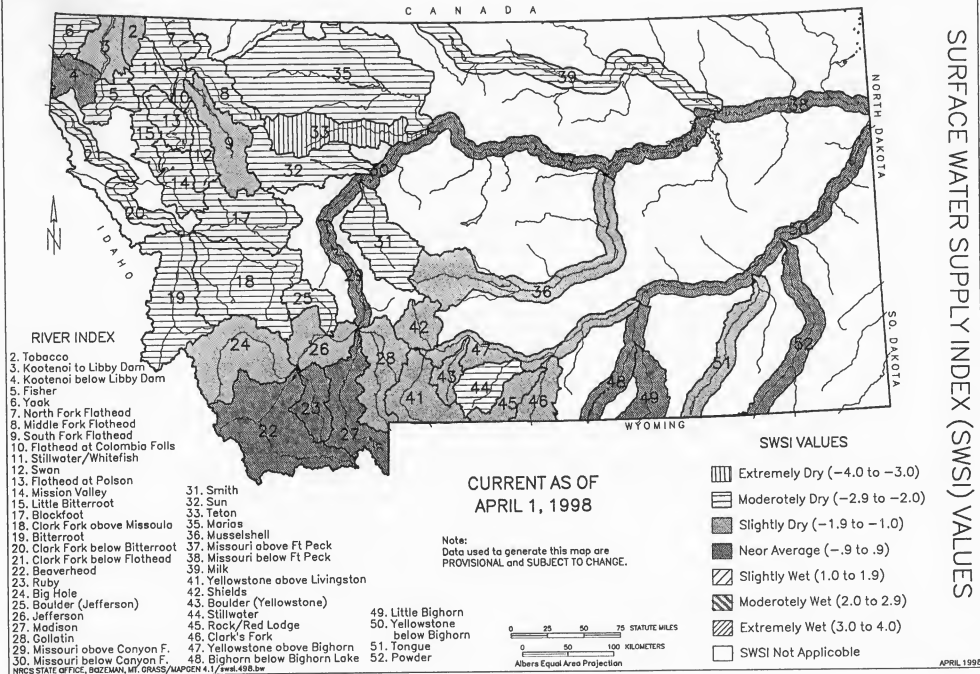














BASIN SUMMARY OF  
SNOW COURSE DATA

APRIL 1998

| SNOW COURSE          | ELEVATION | DATE    | SNOW<br>DEPTH | WATER<br>CONTENT | LAST<br>YEAR | AVERAGE<br>1961-90 |
|----------------------|-----------|---------|---------------|------------------|--------------|--------------------|
| -----                |           |         |               |                  |              |                    |
| MONTANA              |           |         |               |                  |              |                    |
| ABE LINCOLN          | 4440      | 3/26/98 | 38            | 14.1             | 31.0         | --                 |
| ABUNDANCE LAKE       | 8800      | 4/01/98 | ---           | 16.4E            | 28.0         | 20.8               |
| ALBRO LAKE PILLOW    | 8300      | 4/01/98 | ---           | 15.4             | 27.4         | --                 |
| AMBROSE              | 6480      | 4/01/98 | ---           | 9.4E             | 19.7         | 13.2               |
| ASHLEY LAKE          | 4000      | 3/28/98 | 10            | 2.8              | 10.5         | 5.8                |
| ARCH FALLS           | 7350      | 3/26/98 | 27            | 8.2              | 18.0         | 12.8               |
| ASHLEY DIVIDE        | 4820      | 3/31/98 | 10            | 3.2              | 12.3         | 6.6                |
| BADGER PASS PILLOW   | 6900      | 4/01/98 | ---           | 23.0             | 46.3         | 36.5               |
| BALD RIDGE           | 7500      | 3/26/98 | 31            | 9.1              | 19.4         | 13.4               |
| BANFIELD MTN PILLOW  | 5600      | 4/01/98 | ---           | 14.0             | 36.4         | 20.2               |
| BARRE CREEK          | 5500      | 3/30/98 | 76            | 31.8             | 59.9         | 45.3               |
| BARRE MIDWAY         | 4600      | 3/30/98 | 64            | 24.3             | 51.6         | 35.1               |
| BARRE TRAIL          | 3800      | 3/30/98 | 15            | 6.0              | 17.5         | 8.4                |
| BARKER LAKES PILLOW  | 8250      | 4/01/98 | ---           | 12.1             | 18.6         | 15.4               |
| BASIN CREEK PILLOW   | 7180      | 4/01/98 | ---           | 9.7              | 10.4         | 8.7                |
| BASSOO PEAK          | 5150      | 3/31/98 | 15            | 5.0              | 16.5         | 11.3               |
| BEAGLE SPGS PILLOW   | 8850      | 4/01/98 | ---           | 9.4              | 12.3         | 8.4                |
| BEAR BASIN           | 8150      | 3/26/98 | 50            | 16.5             | 26.9         | 21.4               |
| BEAVER CREEK PILLOW  | 7850      | 4/01/98 | ---           | 17.5             | 29.6         | 18.3               |
| BERRY MEADOW         | 7000      | 3/27/98 | 15            | 4.2              | 8.8          | 8.0                |
| BIG CREEK            | 6750      | 3/30/98 | 88            | 32.6             | 59.8         | 45.7               |
| BIG SNOWY            | 7150      | 3/26/98 | 40            | 11.1             | 21.6         | 22.4               |
| BISSEON CREEK PILLOW | 4920      | 4/01/98 | ---           | 8.8              | 19.1         | 10.2               |
| BLACK BEAR PILLOW    | 7950      | 4/01/98 | ---           | 37.5             | 70.0         | 38.5               |
| BLACK MOUNTAIN       | 7750      | 3/27/98 | 52            | 15.8             | 19.7         | 16.3               |
| BLACK PINE PILLOW    | 7100      | 4/01/98 | ---           | 8.3              | 18.0         | 12.7               |
| BLACKTAIL            | 5650      | 3/31/98 | 27            | 8.0              | 26.9         | 14.2               |
| BLOODY DICK PILLOW   | 7550      | 4/01/98 | ---           | 10.2             | 19.7         | 12.6               |
| BLUE LAKE            | 5900      | 3/31/98 | 36            | 11.8             | 30.1         | 25.3               |
| BOTS SOTS            | 7750      | 3/31/98 | 22            | 8.7              | 13.0         | 8.2                |
| BOULDER MTN PILLOW   | 7950      | 4/01/98 | ---           | 16.1             | 27.1         | 20.6               |
| BOX CANYON PILLOW    | 6700      | 4/01/98 | ---           | 8.2              | 15.6         | 10.3               |
| BOXELDER CREEK       | 5100      | 3/30/98 | 22            | 6.0              | 8.2          | 8.3                |
| BRACKETT CR PILLOW   | 7320      | 4/01/98 | ---           | 18.1             | 34.3         | 21.2               |
| BRANHAM LAKES        | 8850      | 3/24/98 | 63            | 21.6             | 41.0         | 30.2               |
| BRISTOW CREEK        | 3900      | 3/31/98 | 14            | 5.7              | 17.4         | 9.4                |
| BRUSH CREEK TIMBER   | 5000      | 3/30/98 | 12            | 3.1              | 12.4         | 9.5                |
| BULL MOUNTAIN        | 6600      | 3/25/98 | 12            | 2.9              | 9.8          | 6.4                |
| CABIN CREEK          | 5200      | 3/25/98 | 9             | 2.9              | 7.8          | 6.2                |
| CALL ROAD            | 8050      | 4/03/98 | 31            | 11.0             | 14.6         | 12.4               |
| CALVERT CR PILLOW    | 6430      | 4/01/98 | ---           | 7.3              | 16.4         | 8.9                |
| CAMP MISERY          | 6400      | 3/29/98 | 107           | 40.9             | 80.8         | 49.0               |
| CAMP SENIA           | 7890      | 3/31/98 | 23            | 6.7              | 10.2         | 6.6                |

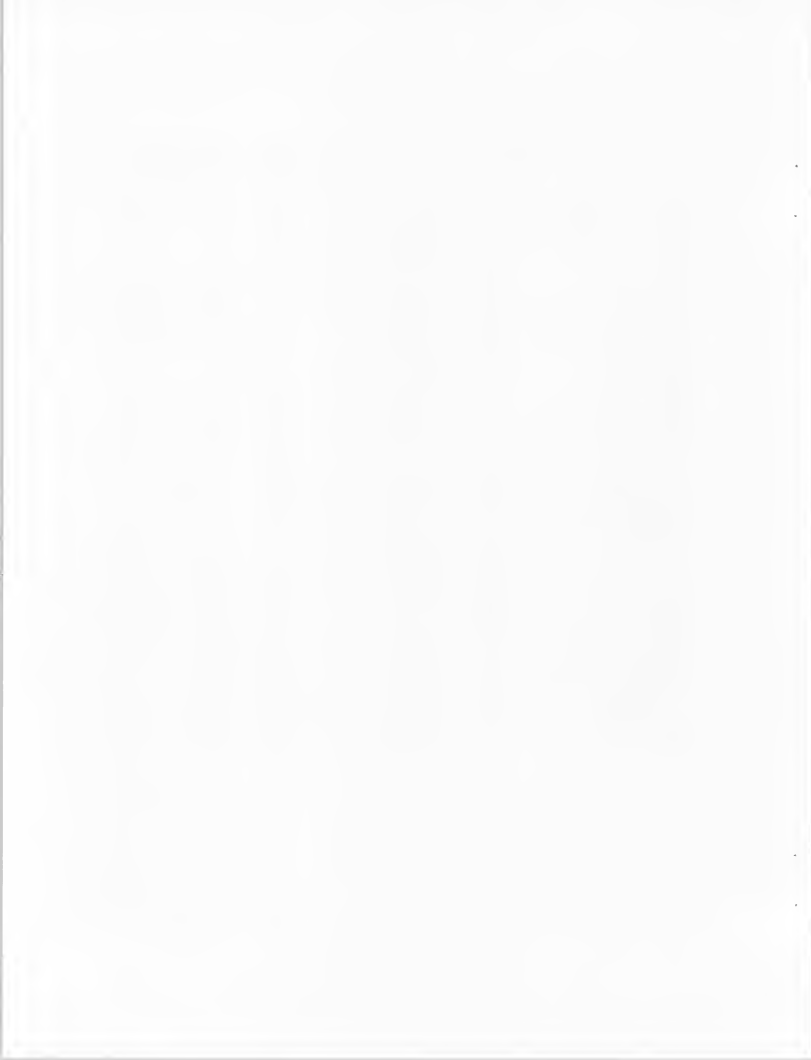
| SNOW COURSE          | ELEVATION | DATE    | SNOW<br>DEPTH | WATER<br>CONTENT | LAST<br>YEAR | AVERAGE<br>1961-90 |
|----------------------|-----------|---------|---------------|------------------|--------------|--------------------|
| CARROT BASIN PILLOW  | 9000      | 4/01/98 | ---           | 25.5             | 41.0         | 28.3               |
| CARTER CREEK         | 7400      | 3/30/98 | 29            | 7.5              | 8.8          | 5.9                |
| CEDAR GROVE          | 3760      | 3/26/98 | 20            | 5.9              | 24.8         | 12.2               |
| CHESSMAN RESERVOIR   | 6200      | 3/26/98 | 5             | 1.5              | 3.3          | 3.9                |
| CHICKEN CREEK        | 4060      | 3/31/98 | 29            | 10.7             | 27.4         | 14.0               |
| CLOVER MDW PILLOW    | 8800      | 4/01/98 | ---           | 17.3             | 21.7         | 18.6               |
| COLE CREEK PILLOW    | 7850      | 4/01/98 | ---           | 13.3             | 16.3         | 17.3               |
| COLLEY CREEK         | 6300      | 3/30/98 | 21            | 6.0              | 12.8         | 8.9                |
| COMBINATION PILLOW   | 5600      | 4/01/98 | ---           | 3.0              | 7.0          | 5.8                |
| COPPER BOTTOM PILLOW | 5200      | 4/01/98 | ---           | 5.7              | 19.3         | 11.7               |
| COPPER CAMP PILLOW   | 6950      | 4/01/98 | ---           | 17.8             | 45.0         | 34.9               |
| COPPER CREEK         | 5700      | 4/01/98 | 16            | 6.4              | 19.9         | 14.2               |
| COPPER MOUNTAIN      | 7700      | 3/27/98 | 35            | 10.0             | 17.1         | 11.4               |
| COTTONWOOD CREEK     | 6400      | 3/27/98 | 27            | 7.7              | 13.0         | 8.8                |
| COYOTE HILL          | 4200      | 3/30/98 | 19            | 6.3              | 19.0         | 9.5                |
| CREVICE MOUNTAIN     | 8400      | 3/28/98 | 37            | 9.3              | 15.8         | 10.9               |
| CRYSTAL LAKE PILLOW  | 6050      | 4/01/98 | ---           | 8.0              | 14.7         | 12.8               |
| DAD CREEK LAKE       | 8400      | 4/03/98 | 48            | 14.6             | 17.0         | 15.1               |
| DAISY PEAK           | 7600      | 3/31/98 | 29            | 7.2              | 12.3         | 10.6               |
| DAISY PEAK           | 7600      | 3/31/98 | 29            | 7.2              | 12.3         | 10.6               |
| DALY CREEK PILLOW    | 5780      | 4/01/98 | ---           | 9.6              | 19.0         | 11.9               |
| DARKHORSE LK. PILLOW | 8700      | 4/01/98 | ---           | 24.1             | 43.6         | 33.7               |
| DAVIS CREEK          | 5400      | 4/01/98 | 50            | 20.3             | 36.7         | 24.3               |
| DEADMAN CR PILLOW    | 6450      | 4/01/98 | ---           | 9.1              | 15.1         | 10.2               |
| DEADMAN CREEK        | 6450      | 4/02/98 | 25            | 9.2              | 14.6         | 11.3               |
| DESERT MOUNTAIN      | 5600      | 4/01/98 | 29            | 10.6             | 23.7         | 15.5               |
| DISCOVERY BASIN      | 7050      | 3/30/98 | 32            | 10.2             | 16.8         | 11.3               |
| DIVIDE PILLOW        | 7800      | 4/01/98 | ---           | 9.6              | 14.6         | 11.3               |
| DIX HILL             | 6400      | 3/29/98 | 24            | 8.0              | 14.0         | 11.3               |
| DUPUYER CREEK PILLOW | 5750      | 4/01/98 | ---           | 3.9              | 12.6         | 12.9               |
| EAGLE CREEK          | 7000      | 4/01/98 | 30            | 10.5             | 24.6         | 14.4               |
| EAST FORK R.S.       | 5400      | 3/26/98 | 14            | 3.2              | 10.4         | 5.6                |
| EL DORADO MINE       | 7800      | 3/28/98 | 56            | 19.4             | 25.6         | 21.6               |
| ELK HORN SPRINGS     | 7800      | 4/01/98 | ---           | 7.5E             | 13.6         | 9.3                |
| ELK PEAK             | 8000      | 3/29/98 | 48            | 11.4             | 22.8         | 17.3               |
| EMERY CREEK PILLOW   | 4350      | 4/01/98 | ---           | 10.1             | 24.7         | 16.3               |
| FATTY CREEK          | 5500      | 3/30/98 | 51            | 17.6             | 44.5         | 24.3               |
| FISH CREEK           | 8000      | 3/24/98 | 34            | 9.8              | 13.3         | 9.9                |
| FISHER CREEK PILLOW  | 9100      | 4/01/98 | ---           | 29.3             | 56.0         | 36.1               |
| FIVE-BULL            | 5700      | 3/31/98 | 9             | 3.1              | 10.1         | 6.3                |
| FLATTOP MTN PILLOW   | 6300      | 4/01/98 | ---           | 37.5             | 65.7         | 47.1               |
| FLEECER RIDGE        | 7500      | 3/25/98 | 24            | 7.3              | 17.5         | 11.3               |
| FOOLHEN              | 8280      | 4/02/98 | 48            | 15.2             | 23.4         | 17.1               |
| FOREST LAKE          | 6400      | 4/01/98 | 27            | 9.0              | 19.5         | 12.6               |
| FOUR MILE            | 6900      | 3/25/98 | 18            | 5.6              | 11.0         | 8.9                |
| FOURTH OF JULY       | 3450      | 3/26/98 | 16            | 5.5              | 15.2         | 7.4                |
| FRED BURR PASS       | 8000      | 3/30/98 | 69            | 22.8             | 32.2         | 25.4               |
| FREIGHT CREEK        | 6000      | 3/31/98 | 20            | 5.7              | 18.8         | 15.5               |
| FROHNER MDWS PILLOW  | 6480      | 4/01/98 | ---           | 6.5              | 9.5          | 8.7                |
| GARVER CREEK PILLOW  | 4250      | 4/01/98 | ---           | 8.7              | 18.2         | 10.1               |

| SNOW COURSE          | ELEVATION | DATE    | SNOW<br>DEPTH | WATER<br>CONTENT | LAST<br>YEAR | AVERAGE<br>1961-90 |
|----------------------|-----------|---------|---------------|------------------|--------------|--------------------|
| GARVER CREEK         | 4250      | 3/27/98 | 22            | 7.3              | 19.2         | 10.2               |
| GIBBONS PASS         | 7100      | 3/26/98 | 47            | 17.0             | 31.6         | 23.2               |
| GOAT MOUNTAIN        | 7000      | 3/26/98 | 17            | 4.2              | 14.3         | 10.5               |
| GOLD CREEK LAKE      | 7200      | 3/28/98 | 36            | 11.6             | 20.4         | 15.9               |
| GOLD STONE           | 8100      | 4/03/98 | 45            | 14.3             | 22.6         | 17.4               |
| GRASSHOPPER          | 7000      | 3/29/98 | 26            | 5.6              | 9.3          | 6.2                |
| GRAVE CRK PILLOW     | 4300      | 4/01/98 | ---           | 12.8             | 24.7         | 16.7               |
| GRIFFIN CR DIVIDE    | 5150      | 3/31/98 | 16            | 5.0              | 17.2         | 11.2               |
| GUNSIGHT LAKE        | 6300      | 3/31/98 | 72            | 27.8             | 52.4         | 40.0               |
| HAND CREEK PILLOW    | 5030      | 4/01/98 | ---           | 8.3              | 20.5         | 13.3               |
| HAWKINS LAKE PILLOW  | 6450      | 4/01/98 | ---           | 17.8             | 33.8         | 29.0               |
| HAYMAKER             | 8050      | 3/31/98 | 46            | 10.2             | 15.2         | 12.7               |
| HEART LAKE TRAIL     | 4800      | 3/30/98 | 45            | 15.4             | 33.6         | 21.6               |
| HEBGEN DAM           | 6550      | 4/02/98 | 29            | 11.0             | 15.7         | 12.1               |
| HELL ROARING DIVIDE  | 5770      | 3/28/98 | 60            | 21.2             | 40.2         | 31.0               |
| HERRIG JUNCTION      | 4850      | 3/31/98 | 52            | 20.7             | 39.2         | 26.0               |
| HOLBROOK             | 4530      | 3/30/98 | 14            | 5.0              | 16.9         | 9.0                |
| HOODOO BASIN         | 6050      | 3/30/98 | 88            | 34.4             | 69.5         | 51.0               |
| HOODOO BASIN PILLOW  | 6050      | 4/01/98 | ---           | 30.8             | 70.7         | 47.0               |
| INDEPENDENCE         | 7850      | 3/27/98 | 47            | 13.4             | 24.5         | 18.3               |
| INTERGAARD           | 6450      | 3/26/98 | 22            | 7.1              | 12.1         | 8.6                |
| JAHNKE LAKE TRAIL    | 7200      | 4/02/98 | 26            | 8.6              | 13.6         | 10.0               |
| JOHNSON PARK         | 6450      | 3/31/98 | 10            | 3.4              | 7.2          | 6.9                |
| KEELER CREEK         | 3300      | 3/31/98 | 27            | 9.6              | 30.4         | 10.8               |
| KESHS HILL           | 7500      | 4/01/98 | 34            | 9.2              | 16.4         | 14.5               |
| KISHENEHN            | 3890      | 3/27/98 | 20            | 6.6              | 14.5         | 7.0                |
| KIWANIS CAMP         | 3720      | 3/30/98 | 0             | .0               | .0           | .8                 |
| KRAFT CREEK PILLOW   | 4750      | 4/01/98 | ---           | 8.5              | 28.7         | 15.3               |
| LAKE CREEK           | 6100      | 4/01/98 | ---           | 8.7E             | 10.6         | 8.5                |
| LAKEVIEW CANYON      | 6930      | 3/31/98 | 30            | 9.4              | 12.6         | 12.3               |
| LAKEVIEW RDG. PILLOW | 7400      | 4/01/98 | ---           | 11.1             | 13.7         | 13.0               |
| LEMHI RIDGE PILLOW   | 8100      | 4/01/98 | ---           | 10.4             | 14.5         | 11.1               |
| LICK CREEK PILLOW    | 6860      | 4/01/98 | ---           | 10.6             | 16.5         | 14.4               |
| LICK CREEK           | 6860      | 3/26/98 | 27            | 9.0              | --           | 10.7               |
| LITTLE PARK          | 7400      | 3/26/98 | 40            | 12.4             | 23.0         | 16.3               |
| LOGAN CREEK          | 4300      | 3/30/98 | 14            | 3.8              | 11.2         | 7.1                |
| LONE MOUNTAIN PILLOW | 8880      | 4/01/98 | ---           | 16.9             | 27.9         | 19.2               |
| LOST HORSE           | 5940      | 3/28/98 | 53            | 17.6             | 43.6         | 32.3               |
| LOST SOUL            | 4800      | 3/31/98 | 24            | 9.4              | 23.4         | 15.3               |
| LOWER TWIN PILLOW    | 7900      | 4/01/98 | ---           | 14.7             | 24.4         | 18.6               |
| LUBRECHT PILLOW      | 4680      | 4/01/98 | ---           | 2.8              | 7.7          | 5.1                |
| LUBRECHT FOREST NO 3 | 5450      | 4/01/98 | 10            | 2.8              | 10.4         | 6.8                |
| LUBRECHT FOREST NO 4 | 4650      | 4/01/98 | 0             | .0               | 4.1          | 2.1                |
| LUBRECHT FOREST NO 6 | 4040      | 3/31/98 | 0             | .0               | 6.4          | 2.3                |
| LUBRECHT HYDROPLT    | 4200      | 3/31/98 | 0             | .0               | 8.5          | 4.2                |
| MADISON PLT PILLOW   | 7750      | 4/01/98 | ---           | 21.0             | 42.0         | 24.8               |
| MANY GLACIER PILLOW  | 4900      | 4/01/98 | ---           | 12.1             | 23.7         | 16.6               |
| MARIAS PASS          | 5250      | 3/27/98 | 32            | 11.4             | 30.0         | 17.4               |
| MAYNARD CREEK        | 6210      | 3/27/98 | 31            | 10.0             | 23.8         | 15.1               |
| MIDDLE MILL CREEK    | 7850      | 3/24/98 | 34            | 10.6             | 20.6         | 16.6               |

| SNOW COURSE          | ELEVATION | DATE    | SNOW<br>DEPTH | WATER<br>CONTENT | LAST<br>YEAR | AVERAGE<br>1961-90 |
|----------------------|-----------|---------|---------------|------------------|--------------|--------------------|
| MILL CREEK           | 7500      | 3/30/98 | 36            | 11.8             | 20.0         | 13.7               |
| MINERAL CREEK        | 4000      | 3/28/98 | 41            | 15.5             | 30.6         | 17.5               |
| MONUMENT PK PILLOW   | 8850      | 4/01/98 | ---           | 19.3             | 33.2         | 21.4               |
| MOSS PEAK PILLOW     | 6780      | 4/01/98 | ---           | 29.6             | 64.1         | 38.4               |
| MT LOCKHART PILLOW   | 6400      | 4/01/98 | ---           | 15.0             | 29.7         | 21.5               |
| MUDD LAKE            | 7650      | 3/26/98 | 48            | 15.2             | 28.3         | 20.0               |
| MULE CREEK PILLOW    | 8300      | 4/01/98 | ---           | 13.5             | 22.8         | 16.2               |
| NEVADA CREEK PILLOW  | 6480      | 4/01/98 | ---           | 10.1             | 21.2         | 13.4               |
| NEVADA RIDGE PILLOW  | 7020      | 4/01/98 | ---           | 11.1             | 20.4         | 15.3               |
| NEW WORLD            | 6900      | 3/27/98 | 40            | 12.7             | 21.6         | 15.7               |
| NEWTON MOUNTAIN      | 5600      | 3/26/98 | 69            | 27.1             | 48.1         | 35.6               |
| NEZ PERCE CMP PILLOW | 5650      | 4/01/98 | ---           | 11.1             | 23.7         | 15.1               |
| NEZ PERCE CREEK      | 6600      | 3/27/98 | 16            | 5.0              | 11.0         | 7.1                |
| NEZ PERCE PASS       | 6570      | 3/27/98 | 36            | 13.2             | 23.6         | 19.2               |
| NOISY BASIN PILLOW   | 6040      | 4/01/98 | ---           | 36.0             | 71.1         | 40.7               |
| N.F. ELK CR PILLOW   | 6250      | 4/01/98 | ---           | 8.8              | 17.8         | 13.2               |
| NF JOCKO PILLOW      | 6330      | 4/01/98 | ---           | 33.6             | 67.6         | 46.7               |
| N.E. ENTRANCE PILLOW | 7350      | 4/01/98 | ---           | 6.9              | 12.0         | 9.2                |
| NOTCH                | 8500      | 4/03/98 | 59            | 19.6             | 18.6         | 16.4               |
| OPHIR PARK           | 7150      | 3/29/98 | 37            | 11.6             | 21.4         | 18.0               |
| PALISADE CREEK       | 8250      | 3/26/98 | 74            | 26.4             | 42.3         | 29.9               |
| PETERSON MEADOWS     | 7200      | 3/31/98 | 32            | 9.6              | 14.2         | 10.8               |
| PICKET PIN LOWER     | 6200      | 3/25/98 | 0             | .0               | 2.8          | 3.0                |
| PICKET PIN MIDDLE    | 7250      | 3/25/98 | 18            | 6.6              | 12.6         | 13.4               |
| PICKET PIN UPPER     | 8100      | 3/25/98 | 44            | 13.6             | 24.8         | 20.9               |
| PICKFOOT CRK PILLOW  | 6650      | 4/01/98 | ---           | 7.6              | 15.3         | 11.0               |
| PIKE CREEK PILLOW    | 5930      | 4/01/98 | ---           | 17.9             | 42.2         | 27.9               |
| PIPESTONE PASS       | 7200      | 3/26/98 | 16            | 5.0              | 8.0          | 5.9                |
| PLACER BASIN PILLOW  | 8830      | 4/01/98 | ---           | 14.6             | 24.8         | 19.1               |
| POORMAN CREEK        | 5100      | 3/26/98 | 58            | 22.1             | 43.9         | 34.4               |
| PORCUPINE PILLOW     | 6500      | 4/01/98 | ---           | 5.8              | 12.0         | 7.4                |
| POTOMAGETON PARK     | 7150      | 4/02/98 | 30            | 11.5             | 19.3         | 14.6               |
| RED MOUNTAIN         | 6000      | 3/31/98 | 38            | 13.7             | 28.6         | 18.9               |
| RED TOP              | 5260      | 3/26/98 | 58            | 23.2             | 41.3         | 29.0               |
| REVAIS CREEK         | 4800      | 3/30/98 | 0             | .0               | 3.1          | 2.1                |
| ROCK CREEK           | 5600      | 3/26/98 | 23            | 6.4              | 9.2          | 10.6               |
| ROCK CREEK MEADOW    | 8160      | 3/30/98 | 61            | 19.9             | 31.2         | 22.0               |
| ROCKER PEAK PILLOW   | 8000      | 4/01/98 | ---           | 13.3             | 18.0         | 15.3               |
| ROCKY BOY PILLOW     | 4700      | 4/01/98 | ---           | 2.9              | 2.7          | 4.9                |
| ROCKY BOY            | 4700      | 3/30/98 | 3             | 1.0              | .9           | 4.4                |
| SACAJAWEA            | 6550      | 3/26/98 | 32            | 11.1             | 24.3         | 14.6               |
| SADDLE MTN PILLOW    | 7900      | 4/01/98 | ---           | 20.4             | 39.2         | 26.1               |
| SHORT CREEK PILLOW   | 7000      | 4/01/98 | ---           | 5.8              | 7.2          | 6.3                |
| SHOWER FALLS PILLOW  | 8100      | 4/01/98 | ---           | 20.1             | 31.7         | 23.8               |
| SILVER RUN PILLOW    | 6630      | 4/01/98 | ---           | 3.4              | 5.8          | 6.8                |
| SKALKAHO PILLOW      | 7260      | 4/01/98 | ---           | 20.4             | 39.5         | 24.9               |
| SLAG-A-MELT LAKE     | 8750      | 4/02/98 | 58            | 19.9             | 38.6         | 25.8               |
| SLIDE ROCK MOUNTAIN  | 7100      | 3/28/98 | 34            | 11.2             | 20.5         | 16.7               |
| SMUGGLER MINE        | 6960      | 3/24/98 | 25            | 7.5              | 12.3         | 10.5               |
| S.F. SHIELDS PILLOW  | 8100      | 4/01/98 | ---           | 14.9             | 30.0         | 17.9               |



| SNOW COURSE          | ELEVATION | DATE    | SNOW<br>DEPTH | WATER<br>CONTENT | LAST<br>YEAR | AVERAGE<br>1961-90 |
|----------------------|-----------|---------|---------------|------------------|--------------|--------------------|
| SPOTTED BEAR MTN.    | 7000      | 3/31/98 | 21            | 7.3              | 22.4         | 14.9               |
| SPUR PARK PILLOW     | 8100      | 4/01/98 | ---           | 17.8             | 27.8         | 22.2               |
| SQUAW PEAK PILLOW    | 6150      | 4/01/98 | ---           | 11.5             | 29.7         | 15.6               |
| STAHL PEAK PILLOW    | 6030      | 4/01/98 | ---           | 33.1             | 49.2         | 35.1               |
| STAHL PEAK           | 6030      | 3/27/98 | 97            | 37.8             | --           | 39.7               |
| STEMPLE PASS         | 6600      | 3/27/98 | 19            | 5.4              | 13.8         | 10.6               |
| STORM LAKE           | 7780      | 3/31/98 | 45            | 12.7             | 18.3         | 14.0               |
| STRYKER BASIN        | 6180      | 3/31/98 | 74            | 27.4             | 44.5         | 34.6               |
| STUART MOUNTAIN      | 7400      | 3/30/98 | 66            | 25.2             | 50.9         | 32.9               |
| STUART MOUNTAIN PILL | 7400      | 4/01/98 | ---           | 24.4             | 47.8         | 30.9               |
| SUCKER CREEK         | 3960      | 3/30/98 | 0             | .0               | .0           | .4                 |
| TAYLOR ROAD          | 4080      | 3/30/98 | 0             | .0               | .2           | 2.2                |
| TEN MILE LOWER       | 6600      | 3/26/98 | 16            | 4.2              | 8.7          | 7.8                |
| TEN MILE MIDDLE      | 6800      | 3/26/98 | 27            | 7.2              | 13.8         | 12.2               |
| TEPEE CREEK PILLOW   | 8000      | 4/01/98 | ---           | 14.1             | 18.8         | 13.4               |
| TIMBERLINE CREEK     | 8850      | 3/31/98 | 45            | 10.6             | 23.3         | 14.8               |
| TIZER BASIN PILLOW   | 6840      | 4/01/98 | ---           | 9.9              | 11.8         | 12.0               |
| TRAIL CREEK          | 7090      | 4/03/98 | 24            | 7.4              | 9.0          | 8.7                |
| TRINKUS LAKE         | 6100      | 3/31/98 | 75            | 30.6             | 67.9         | 43.4               |
| TRUMAN CREEK         | 4060      | 3/29/98 | 8             | 2.3              | 9.0          | 3.5                |
| TV MOUNTAIN          | 6800      | 3/30/98 | 39            | 13.3             | 29.6         | 19.2               |
| TWELVEMILE PILLOW    | 5600      | 4/01/98 | ---           | 12.7             | 31.9         | 18.6               |
| TWENTY-ONE MILE      | 7150      | 3/27/98 | 40            | 12.7             | 24.2         | 17.4               |
| TWIN CREEKS          | 3580      | 3/31/98 | 13            | 4.9              | 21.3         | 10.3               |
| TWIN LAKES PILLOW    | 6400      | 4/01/98 | ---           | 31.6             | 65.9         | 40.4               |
| UPPER HOLLAND LAKE   | 6200      | 3/31/98 | 66            | 27.2             | 53.0         | 35.4               |
| WALDRON PILLOW       | 5600      | 4/01/98 | ---           | 7.5              | 17.4         | 11.3               |
| WARM SPRINGS PILLOW  | 7800      | 4/01/98 | ---           | 20.5             | 31.2         | 22.3               |
| WEASEL DIVIDE        | 5450      | 3/27/98 | 74            | 26.4             | 41.0         | 33.8               |
| WEST YELLOWSTONE     | 6700      | 3/27/98 | 26            | 8.2              | 17.3         | 11.6               |
| WHISKEY CREEK PILLOW | 6800      | 4/01/98 | ---           | 14.4             | 25.6         | 17.5               |
| WHITE MILL PILLOW    | 8700      | 4/01/98 | ---           | 23.4             | 38.2         | 25.1               |
| WHITE PINE RIDGE     | 8850      | 4/03/98 | 26            | 7.6              | 6.8          | 5.8                |
| WILLOW CREEK         | 6500      | 3/26/98 | 19            | 6.0              | 9.8          | 9.5                |
| WOOD CREEK PILLOW    | 5960      | 4/01/98 | ---           | 6.5              | 15.7         | 12.2               |
| WRONG CREEK          | 5700      | 3/24/98 | 19            | 5.4              | 19.7         | 13.6               |
| WRONG RIDGE          | 6800      | 3/24/98 | 32            | 10.1             | 25.7         | 19.4               |



# Montana Water Supply Outlook Report as of April 1, 1998

March started off with snow and cool temperatures. By the middle of the month, temperatures warmed into the fifties with average daily temperatures in the mid to upper thirties. There were several days where the lows remained above freezing and low to mid elevation mountain snowpack began to melt. With the warm temperatures, most of the low to mid elevation snowpack has warmed enough so that when temperatures remain above freezing there again will be melting of the mountain snowpack. During the last week of March, most areas again picked up some snow and the average daily temperatures stayed below freezing, stopping mountain snowpack melt. West of the Divide, average temperature departures ranged from 1 to 3 degrees above average and east of the Divide temperature departures ranged from 1 to 5 degrees below average.

## Snowpack

Storms that brought snow to the mountains and valleys across the state were highly variable. The northwest, southwest, and southcentral areas saw the most increases, while the central and northcentral saw the least increases. Lack of storms and warm temperatures has put the Flathead River Basin the lowest of record, 1961 through 1997, Sun-Teton-Marias River Basins tied with the lowest years of record, and several other basins are among the five lowest years of record.

By this time of year, most areas are at or near their winter snowpack peak, with the exception of the Madison, Gallatin and Yellowstone basins where the snowpack peak usually occurs around the first of May. The low and mid elevation mountain snowpack has begun melting and will continued to do so when average daily air temperatures remain above freezing.

As of April 1, mountain snow water content was 74 percent of average and 52 percent of last year. West of the Continental Divide, snow water content was 73 percent of average and 50 percent of last year. East of the Continental Divide, snow water content was 80 percent of average and 59 percent of last year.

| RIVER BASIN                   | % OF AVERAGE | % OF LAST YEAR |
|-------------------------------|--------------|----------------|
| COLUMBIA .....                | 73 .....     | 50             |
| KOOTENAI .....                | 74 .....     | 49             |
| FLATHEAD .....                | 71 .....     | 47 #           |
| UPPER CLARK FORK .....        | 73 .....     | 53 ###         |
| BITTERROOT .....              | 72 .....     | 47             |
| LOWER CLARK FORK .....        | 69 .....     | 46 ###         |
| MISSOURI .....                | 76 .....     | 56             |
| MISSOURI HEADWATERS .....     | 82 .....     | 59             |
| JEFFERSON .....               | 81 .....     | 60             |
| MADISON .....                 | 88 .....     | 60             |
| GALLATIN .....                | 81 .....     | 57             |
| MISSOURI MAINSTEM .....       | 62 .....     | 50             |
| HEADWATERS MAINSTEM .....     | 71 .....     | 58 ###         |
| SMITH-JUDITH-MUSSELSHELL ..   | 70 .....     | 55 ###         |
| SUN-TETON-MARIAS .....        | 54 .....     | 40 ##          |
| MILK (BEARPAW MTNS.) .....    | 47 .....     | 82             |
| ST. MARY .....                | 80 .....     | 54             |
| ST. MARY and MILK .....       | 73 .....     | 57             |
| YELLOWSTONE .....             | 87 .....     | 63             |
| UPPER YELLOWSTONE .....       | 82 .....     | 56             |
| LOWER YELLOWSTONE (WYOMING) . | 94 .....     | 72             |
| WIND .....                    | 98 .....     | 70             |
| SHOSHONE .....                | 91 .....     | 61             |
| BIGHORN .....                 | 94 .....     | 70             |
| TONGUE .....                  | 90 .....     | 81             |
| POWDER .....                  | 93 .....     | 79             |

# - Basin snow water average is the lowest of record, 1961-1997.

## - Basin snow water average is tied with the lowest of record, 1961-1997.

###- Basin snow water average is ranked in the lowest five of record.

## Precipitation

March mountain and valley precipitation, across the state, was 91 percent of average and 76 percent of last year, while water year precipitation was 84 percent of average and 60 percent above last year.

West of the Continental Divide, March mountain and valley precipitation was 92 percent of average and 60 percent of last year and water year precipitation was 81 percent of average and 56 percent of last year. East of the Continental Divide, March mountain and valley precipitation was 91 percent of average and 92 percent of last year and water year precipitation was 86 percent of average and 64 percent of last year.

Combined mountain and valley precipitation are as follows:

| RIVER BASIN                    | MARCH<br>% OF AVERAGE | WATER YEAR<br>% OF AVERAGE |
|--------------------------------|-----------------------|----------------------------|
| COLUMBIA .....                 | 92 .....              | 60 .....                   |
| KOOTENAI .....                 | 97 .....              | 85 .....                   |
| FLATHEAD .....                 | 105 .....             | 81 .....                   |
| UPPER CLARK FORK .....         | 82 .....              | 80 .....                   |
| BITTERROOT .....               | 77 .....              | 85 .....                   |
| LOWER CLARK FORK .....         | 85 .....              | 78 .....                   |
| MISSOURI .....                 | 90 .....              | 85 .....                   |
| JEFFERSON .....                | 84 .....              | 91 .....                   |
| MADISON .....                  | 95 .....              | 92 .....                   |
| GALLATIN .....                 | 89 .....              | 86 .....                   |
| MISSOURI MAINSTEM .....        | 73 .....              | 81 .....                   |
| SMITH-JUDITH-MUSSELSHELL ..... | 109 .....             | 79 .....                   |
| SUN-TETON-MARIAS .....         | 76 .....              | 69 .....                   |
| MILK .....                     | 131 .....             | 81 .....                   |
| ST. MARY .....                 | 102 .....             | 79 .....                   |
| YELLOWSTONE .....              | 100 .....             | 95 .....                   |
| UPPER YELLOWSTONE .....        | 88 .....              | 89 .....                   |
| LOWER YELLOWSTONE .....        | 116 .....             | 103 .....                  |
| WIND .....                     | 144 .....             | 130 .....                  |
| SHOSHONE .....                 | 121 .....             | 106 .....                  |
| BIGHORN .....                  | 96 .....              | 97 .....                   |
| TONGUE .....                   | 66 .....              | 101 .....                  |
| POWDER .....                   | 98 .....              | 111 .....                  |

## Reservoirs

Major reservoir storage across the state was 118 percent of average and 110 percent of last year.

West of the Continental Divide, reservoirs were 123 percent of average and 108 percent of last year. East of the Continental Divide, reservoirs were 104 percent of average and 96 percent of last year.

| RIVER BASIN                    | % OF AVERAGE | % OF LAST YEAR |
|--------------------------------|--------------|----------------|
| COLUMBIA .....                 | 123 .....    | 108 .....      |
| KOOTENAI .....                 | 145 .....    | 94 .....       |
| FLATHEAD .....                 | 105 .....    | 127 .....      |
| UPPER CLARK FORK .....         | 119 .....    | 115 .....      |
| BITTERROOT .....               | 96 .....     | 98 .....       |
| LOWER CLARK FORK .....         | 141 .....    | 108 .....      |
| MISSOURI .....                 | 113 .....    | 116 .....      |
| JEFFERSON .....                | 118 .....    | 112 .....      |
| MADISON .....                  | 104 .....    | 111 .....      |
| GALLATIN .....                 | 193 .....    | 110 .....      |
| MISSOURI MAINSTEM .....        | 110 .....    | 132 .....      |
| SMITH-JUDITH-MUSSELSHELL ..... | 134 .....    | 125 .....      |
| SUN-TETON-MARIAS .....         | 121 .....    | 101 .....      |
| MILK .....                     | 105 .....    | 86 .....       |
| ST. MARY .....                 | 92 .....     | 72 .....       |
| YELLOWSTONE .....              | 105 .....    | 111 .....      |
| UPPER YELLOWSTONE .....        | 119 .....    | 122 .....      |
| LOWER YELLOWSTONE .....        | 104 .....    | 111 .....      |

## Streamflow

Streamflow forecasts across Montana were 73 percent of average and 52 percent of last years forecasts. Due to the warm winter, below to well below average snowpacks, and early warming of the snowpack, it is anticipated that streamflow peaks will occur earlier than average and the flows during the peak will generally be below to well below average. It is also anticipated that without timely rains in May and June, water shortages could occur during mid to late summer, especially in areas without reservoir storage.

West of the Continental Divide, streamflows are forecast to be 73 percent of average and 51 percent of last years forecasts. East of the Continental Divide, streamflows are forecast to be 73 percent of average and 52 percent of last years forecasts.

| FORECASTS                     | FORECASTS    |                |
|-------------------------------|--------------|----------------|
| RIVER BASIN                   | % OF AVERAGE | % OF LAST YEAR |
| COLUMBIA .....                | 73 .....     | 51             |
| KOOTENAI .....                | 79 .....     | 65             |
| FLATHEAD .....                | 74 .....     | 52             |
| UPPER CLARK FORK .....        | 65 .....     | 43             |
| BITTERROOT .....              | 73 .....     | 49             |
| LOWER CLARK FORK .....        | 73 .....     | 47             |
| MISSOURI .....                | 75 .....     | 52             |
| JEFFERSON .....               | 84 .....     | 54             |
| MADISON .....                 | 87 .....     | 59             |
| GALLATIN .....                | 87 .....     | 58             |
| MISSOURI MAINSTEM .....       | 76 .....     | 48             |
| SMITH-JUDITH-MUSSELSHELL .... | 73 .....     | 55             |
| SUN-TETON-MARIAS .....        | 62 .....     | 45             |
| MILK .....                    | 56 .....     | 42             |
| ST. MARY .....                | 78 .....     | 61             |
| YELLOWSTONE .....             | 84 .....     | 54             |
| UPPER YELLOWSTONE .....       | 82 .....     | 54             |
| LOWER YELLOWSTONE .....       | 87 .....     | 55             |

NOTE: The **FORECAST AS % OF LAST YEAR** column above, is this years forecast as a percent of last years forecast, not of what actually occurred.

# Surface Water Supply Index

The Surface Water Supply Index (SWSI) is an indicator of surface water supply conditions for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

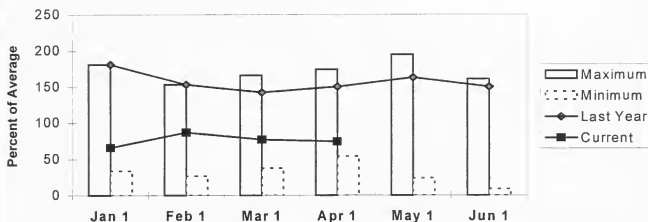
| SWSI RATING  | SURFACE WATER CONDITION |
|--------------|-------------------------|
| +3.0 to +4.0 | Extremely Wet           |
| +2.0 to +3.0 | Moderately Wet          |
| +1.0 to +2.0 | Slightly Wet            |
| -1.0 to +1.0 | Near Average            |
| -1.0 to -2.0 | Slightly Dry            |
| -2.0 to -3.0 | Moderately Dry          |
| -3.0 to -4.0 | Extremely Dry           |

| SWSI | Basin   |
|------|---|
| -1.7 | Kootenai River at Ft. Steele (Kootenai in Canada) |
| -1.3 | Tobacco River                                     |
| -1.4 | Kootenai Ft. Steele to Libby Dam                  |
| +0.4 | Kootenai River below Libby Dam                    |
| -2.9 | Fisher River                                      |
| -2.5 | Yaak River  |
| -2.3 | North Fork Flathead River                         |
| -2.9 | Middle FORK Flathead River                        |
| -1.6 | South Fork Flathead River                         |
| -2.3 | Flathead River at Columbia Falls                  |
| -2.4 | Stillwater/Whitefish Rivers                       |
| -2.7 | Swan River  |
| -2.5 | Flathead River at Polson                          |
| -2.7 | Mission Valley                                    |
| -2.6 | Little Bitterroot River                           |
| -2.4 | Clark Fork River above Rock Creek                 |
| -2.8 | Blackfoot River                                   |
| -2.6 | Clark Fork River above Missoula                   |
| -2.1 | Bitterroot River                                  |
| -2.5 | Clark Fork River below Bitterroot River           |
| -2.5 | Clark Fork River below Flathead River             |
| +0.2 | Beaverhead River                                  |
| -0.8 | Ruby River  |
| -1.9 | Big Hole River                                    |
| -2.7 | Boulder River (Jefferson)                         |
| -1.4 | Jefferson River                                   |
| +0.1 | Madison River                                     |
| -1.4 | Gallatin River                                    |
| -0.9 | Missouri River above Canyon Ferry                 |
| -0.3 | Missouri River below Canyon Ferry                 |
| -2.2 | Smith River                                       |
| -2.9 | Sun River   |
| -3.4 | Teton River                                       |
| -2.4 | Birch/Dupuyer Creeks                              |
| -2.9 | Marias River                                      |
| -1.6 | Musselshell River                                 |
| -0.2 | Missouri River above Ft. Peck                     |
| 0.0  | Missouri River below Ft. Peck                     |
| -2.8 | Milk River  |
| -1.4 | Yellowstone River above Livingston                |
| -1.8 | Shields River                                     |
| -1.8 | Boulder River (Yellowstone)                       |
| -2.2 | Stillwater River                                  |
| -1.7 | Rock/Red Lodge Creeks                             |
| -1.9 | Clarks Fork River                                 |
| -1.6 | Yellowstone River above Bighorn River             |
| +0.9 | Bighorn River below Bighorn Lake                  |
| -0.9 | Little Bighorn River                              |
| -0.4 | Yellowstone River below Bighorn River             |
| -1.5 | Tongue River                                      |
| -0.6 | Powder River                                      |

## Kootenai River Basin in Montana

Snowpack conditions for the Kootenai River Basin in Montana were below average and sixth lowest of record for the period 1961-1997. Snow water content was 26 percent below average and 51 percent below last year. Snowpack conditions for the Kootenai River Basin in Canada were below average. Snow water content was 20 percent below average and 36 percent below last year.

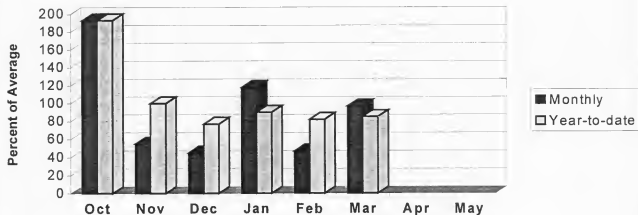
### Kootenai Snow Water Equivalent



January maximum swe was established in 1997 and minimum was in 1977; February maximum swe was in 1997 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1974 and minimum swe was in 1977; May maximum swe was in 1974 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 3 percent below average and 51 percent below last year. Valley precipitation during March was 26 percent below average and 40 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 15 percent below average and 42 percent below last year.

### Kootenai Precipitation



Lake Kootenai storage, on the last day of March, was 45 percent above average and 6 percent below last year.

Streamflows, for the period April through July, are forecast to be 21 percent below average and 35 percent below last years forecasts. Basin forecast range from 38 percent below average to 18 percent below average.

Surface Water Supply Index (SWSI) was -178 in the Kootenai River at Ft. Steele (Kootenai in Canada); -1.3 in the Tobacco River; -1.4 in the Kootenai Ft. Steele to Libby Dam; +0.4 in the Kootenai River below Libby Dam; -2.9 in the Fisher River; and -2.5 in the Yaak River.

**KOOTENAI RIVER BASIN in Montana**  
**Streamflow Forecasts - April 1, 1998**

| Forecast Point          | Forecast Period | <<===== Drier =====>> |          | Future Conditions     |          | ===== Wetter =====>> |          | 30-Yr Avg.<br>(1000AF) |
|-------------------------|-----------------|-----------------------|----------|-----------------------|----------|----------------------|----------|------------------------|
|                         |                 | 90%                   | 70%      | Chance Of Exceeding * |          | 30%                  | 10%      |                        |
|                         |                 | (1000AF)              | (1000AF) | 50% (Most Probable)   | (% AVG.) | (1000AF)             | (1000AF) |                        |
| TOBACCO RIVER nr Eureka | APR-JUL         | 70                    | 86       | 97                    | 73       | 108                  | 124      | 133                    |
|                         | APR-SEP         | 77                    | 95       | 108                   | 74       | 121                  | 139      | 147                    |
| LIBBY RES Inflow (1,2)  | APR-JUL         | 3602                  | 4364     | 4710                  | 82       | 5056                 | 5818     | 5779                   |
|                         | APR-SEP         | 4220                  | 5114     | 5520                  | 82       | 5926                 | 6820     | 6772                   |
| FISHER RIVER near Libby | APR-JUL         | 128                   | 144      | 155                   | 66       | 166                  | 182      | 234                    |
|                         | APR-SEP         | 137                   | 154      | 165                   | 66       | 176                  | 193      | 250                    |
| YAAK RIVER near Troy    | APR-JUL         | 252                   | 281      | 300                   | 62       | 319                  | 348      | 483                    |
|                         | APR-SEP         | 266                   | 295      | 315                   | 62       | 335                  | 364      | 505                    |
| KOOTENAI at Leona (1,2) | APR-JUL         | 4315                  | 5261     | 5690                  | 79       | 6119                 | 7065     | 7199                   |
|                         | APR-SEP         | 4960                  | 6047     | 6540                  | 79       | 7033                 | 8120     | 8275                   |

| KOOTENAI RIVER BASIN in Montana<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |        | KOOTENAI RIVER BASIN in Montana<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                                   |         |
|---|-----------------|------------------------|-----------|--------|--|----------------------|-----------------------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |        | Watershed  | Number of Data Sites | This Year as % of Last Yr Average |         |
|   |                 | This Year              | Last Year | Avg    |  |                      | Last Yr                           | Average |
| LAKE KOOCANUSA  | 5748.0          | 3102.0                 | 3292.0    | 2141.0 | KOOTENAI in CANADA   | 25                   | 64                                | 79      |
|   |                 |                        |           |        | KOOTENAI MAINSTEM  | 8                    | 44                                | 72      |
|   |                 |                        |           |        | TOBACCO  | 3                    | 63                                | 84      |
|   |                 |                        |           |        | FISHER   | 5                    | 45                                | 66      |
|   |                 |                        |           |        | YAAK   | 8                    | 51                                | 75      |
|   |                 |                        |           |        | KOOTENAI in MONTANA  | 23                   | 49                                | 74      |
|   |                 |                        |           |        | ab BONNERS FERRY   | 48                   | 55                                | 76      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

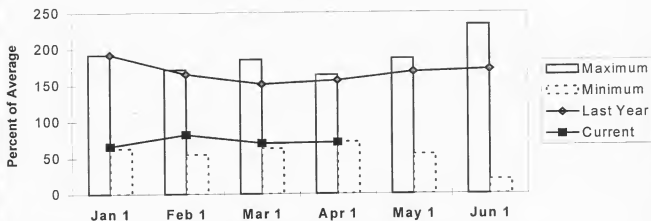
(2) - The value is natural volume - actual volume may be affected by upstream water management.



## Flathead River Basin

Snowpack conditions for the Flathead River Basin in Montana were well below average and the lowest of record, for the period 1961-1997. Snow water content was 29 percent below average and 53 percent below last year. Snowpack conditions for the North Fork Flathead River Basin in Canada were below average. Snow water content was 22 percent below average and 43 percent below last year.

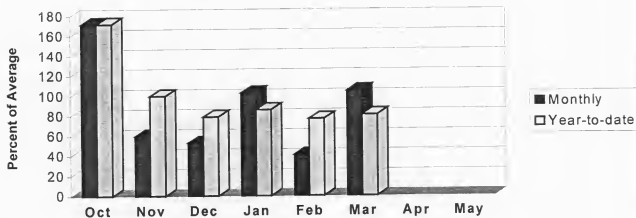
### Flathead Snow Water Equivalent



January maximum swe was established in 1997 and minimum was in 1988; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1992; May maximum swe was in 1972 and minimum was in 1992; and June maximum swe was in 1974 and minimum was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 2 percent above average and 37 percent below last year. Valley precipitation during March was 46 percent above average and 19 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 19 percent below average and 45 percent below last year.

### Flathead Precipitation



Reservoir storage, on the last day of March, was 5 percent above average and 27 percent above last year. Combined Camas reservoir storage was 52 percent above average and 10 percent below last year; the combined Mission Valley reservoir storage was 5 percent below average and 15 percent above last year; Hungry Horse storage was 14 percent above average and 63 percent above last year; and Flathead Lake storage was 20 percent below average and 31 percent below last year.

Streamflows, for the period April through July, are forecast to be 26 percent below average and 48 percent below last years forecasts. Basin forecasts range from 28 percent below average to 26 percent below average.

Surface Water Supply Index (SWSI) was -2.3 in the North Fork Flathead River; -2.9 in the Middle Fork Flathead River; -1.6 in the South Fork Flathead River; -2.3 in the Flathead River at Columbia Falls; -2.4 in the Stillwater/Whitefish Rivers; -2.7 in the Swan River; -2.5 in the Flathead River at Polson; -2.7 in the Mission Valley; and -2.6 in the Little Bitterroot River.

FLATHEAD RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                      | Forecast Period | <----- Drier ----->   |                 | Future Conditions               |          | >----- Wetter -----> |                 | 30-Yr Avg.<br>(1000AF) |
|-------------------------------------|-----------------|-----------------------|-----------------|---------------------------------|----------|----------------------|-----------------|------------------------|
|                                     |                 | Chance Of Exceeding * |                 |                                 |          |                      |                 |                        |
|                                     |                 | 90%<br>(1000AF)       | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | 30%<br>(1000AF)      | 10%<br>(1000AF) |                        |
| NF FLATHEAD nr Columbia Falls       | APR-JUL         | 1027                  | 1130            | 1200                            | 72       | 1270                 | 1373            | 1662                   |
|                                     | APR-SEP         | 1134                  | 1251            | 1330                            | 72       | 1409                 | 1526            | 1836                   |
| MF FLATHEAD nr West Glacier         | APR-JUL         | 1037                  | 1140            | 1210                            | 74       | 1280                 | 1383            | 1638                   |
|                                     | APR-SEP         | 1123                  | 1240            | 1320                            | 74       | 1400                 | 1517            | 1788                   |
| HUNGRY HORSE Reservoir Inflow (1,2) | APR-JUL         | 1229                  | 1422            | 1510                            | 74       | 1598                 | 1791            | 2051                   |
|                                     | APR-SEP         | 1313                  | 1524            | 1620                            | 74       | 1716                 | 1927            | 2184                   |
| FLATHEAD at Columbia Falls (2)      | APR-JUL         | 3501                  | 3828            | 4050                            | 74       | 4272                 | 4599            | 5482                   |
|                                     | APR-SEP         | 3783                  | 4150            | 4400                            | 74       | 4650                 | 5017            | 5960                   |
| STILLWATER nr Whitefish             | APR-JUL         | 96                    | 122             | 140                             | 74       | 158                  | 184             | 189                    |
|                                     | APR-SEP         | 102                   | 134             | 155                             | 74       | 176                  | 208             | 209                    |
| WHITEFISH nr Kalispell              | APR-JUL         | 55                    | 67              | 75                              | 72       | 83                   | 95              | 104                    |
|                                     | APR-SEP         | 59                    | 73              | 83                              | 72       | 93                   | 107             | 116                    |
| SWAN RIVER near Bigfork             | APR-JUL         | 354                   | 396             | 425                             | 73       | 454                  | 496             | 583                    |
|                                     | APR-SEP         | 400                   | 451             | 485                             | 73       | 519                  | 570             | 665                    |
| FLATHEAD Lake Inflow (1,2)          | APR-JUL         | 3722                  | 4395            | 4700                            | 74       | 5005                 | 5678            | 6390                   |
|                                     | APR-SEP         | 3965                  | 4746            | 5100                            | 74       | 5454                 | 6235            | 6926                   |

| FLATHEAD RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |        | FLATHEAD RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|--|-----------------|------------------------|-----------|--------|---|----------------------|-------------------|---------|
| Reservoir  | Usable Capacity | *** Usable Storage *** |           |        | Watershed   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg    |   |                      | Last Yr           | Average |
| CANAS (4)  | 45.2            | 36.1                   | 40.3      | 23.7   | NF FLATHEAD in CANADA   | 3                    | 57                | 78      |
| MISSION VALLEY (8)   | 100.0           | 38.7                   | 33.6      | 40.9   | NF FLATHEAD in MT.  | 9                    | 57                | 81      |
| HUNGRY HORSE   | 3451.0          | 2324.0                 | 1426.0    | 2046.0 | MIDDLE FORK FLATHEAD  | 7                    | 49                | 69      |
| FLATHEAD LAKE  | 1791.0          | 603.1                  | 870.2     | 751.9  | SOUTH FORK FLATHEAD   | 9                    | 46                | 73      |
|  |                 |                        |           |        | STILLWATER-WHITEFISH  | 10                   | 45                | 67      |
|  |                 |                        |           |        | SWAN  | 9                    | 48                | 76      |
|  |                 |                        |           |        | MISSION VALLEY  | 5                    | 45                | 73      |
|  |                 |                        |           |        | LITTLE BITTERROOT-ASHLEY  | 6                    | 28                | 50      |
|  |                 |                        |           |        | JOCKO   | 5                    | 47                | 72      |
|  |                 |                        |           |        | FLATHEAD in MONTANA   | 43                   | 47                | 72      |
|  |                 |                        |           |        | FLATHEAD BASIN  | 46                   | 48                | 73      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

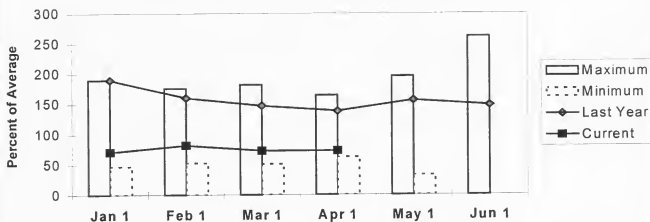
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

## Upper Clark Fork River Basin

Snowpack conditions in the Upper Clark Fork River Basin were below average and third lowest of record, for the period 1961-1997. Snow water content was 27 percent above average and 47 percent below last year.

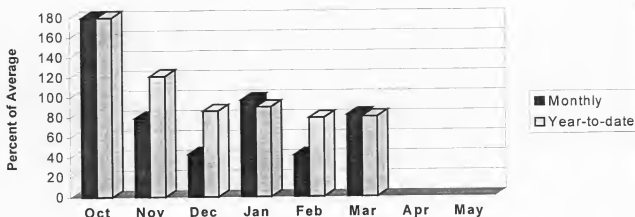
### Upper Clark Fork Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum was in 1994; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1975 and minimum swe was in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 19 percent below average and 35 percent below last year. Valley precipitation during March was 7 percent below average and 6 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 20 percent below average and 42 percent below last year.

### Upper Clark Fork Precipitation



Reservoir storage, on the last day of March, was 19 percent above average and 15 percent above last year. Georgetown Lake storage was 11 percent above average and 5 percent above last year; Lower Willow Creek storage was 43 percent above average and 106 percent above last year; and Nevada Creek storage was 38 percent above average and 33 percent above last year.

Streamflows, for the period April through July, are forecast to be 35 percent below average and 57 percent below last years forecasts. Basin forecasts range from 48 percent below average to 10 percent below average.

Surface Water Supply Index (SWSI) was -2.4 in the Clark Fork River above Rock Creek; -2.8 in the Blackfoot River; and -2.6 in the Clark Fork River above Missoula.

UPPER CLARK FORK RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                  | Forecast Period | <<===== Drier =====>>> |                 | Future Conditions               |          | ===== Wetter =====>>> |                 | 30-Yr Avg.<br>(1000AF) |
|---------------------------------|-----------------|------------------------|-----------------|---------------------------------|----------|-----------------------|-----------------|------------------------|
|                                 |                 | Chance Of Exceeding *  |                 |                                 |          |                       |                 |                        |
|                                 |                 | 90%<br>(1000AF)        | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | 30%<br>(1000AF)       | 10%<br>(1000AF) |                        |
| WARM SPRINGS CK at Anaconda (2) | APR-JUL         | 23                     | 30              | 34                              | 90       | 38                    | 45              | 38                     |
|                                 | APR-SEP         | 30                     | 37              | 42                              | 89       | 47                    | 55              | 47                     |
| LITTLE BLACKFOOT nr Garrison    | APR-JUL         | 14.1                   | 40              | 58                              | 70       | 76                    | 102             | 83                     |
|                                 | APR-SEP         | 13.8                   | 43              | 62                              | 70       | 82                    | 110             | 89                     |
| FLINT CK nr Southern Cross (2)  | APR-JUL         | 4.7                    | 8.2             | 10.6                            | 75       | 13.0                  | 16.5            | 14.2                   |
|                                 | APR-SEP         | 5.0                    | 9.4             | 12.4                            | 74       | 15.4                  | 19.8            | 16.7                   |
| FLINT CK bl Boulder Ck          | APR-JUL         | 21                     | 33              | 42                              | 74       | 51                    | 63              | 57                     |
|                                 | APR-SEP         | 28                     | 43              | 54                              | 74       | 65                    | 80              | 73                     |
| LOWER WILLOW CK RES Inflow      | APR-JUL         | 2.3                    | 5.7             | 8.0                             | 57       | 10.3                  | 13.7            | 14.0                   |
|                                 | APR-SEP         | 2.6                    | 6.1             | 8.5                             | 57       | 10.9                  | 14.4            | 14.8                   |
| MF ROCK CREEK nr Philipaburg    | APR-JUL         | 36                     | 44              | 50                              | 76       | 56                    | 64              | 66                     |
|                                 | APR-SEP         | 39                     | 49              | 55                              | 74       | 61                    | 71              | 74                     |
| ROCK CREEK near Clinton         | APR-JUL         | 139                    | 181             | 210                             | 71       | 239                   | 281             | 296                    |
|                                 | APR-SEP         | 155                    | 203             | 235                             | 71       | 267                   | 315             | 333                    |
| NEVADA CREEK near Finn          | APR-JUL         | 3.7                    | 7.5             | 10.0                            | 52       | 12.5                  | 16.3            | 19.1                   |
|                                 | APR-SEP         | 4.3                    | 8.3             | 11.0                            | 52       | 13.7                  | 17.7            | 21                     |
| CLEARWATER nr Clearwater        | APR-JUL         | 101                    | 112             | 120                             | 70       | 128                   | 139             | 172                    |
|                                 | APR-SEP         | 106                    | 117             | 125                             | 69       | 133                   | 144             | 181                    |
| BLACKFOOT RIVER near Bonner     | APR-JUL         | 435                    | 509             | 560                             | 67       | 611                   | 685             | 835                    |
|                                 | APR-SEP         | 483                    | 564             | 620                             | 67       | 676                   | 757             | 926                    |
| CLARK FORK ab Milltown          | APR-JUL         | 233                    | 362             | 450                             | 69       | 538                   | 667             | 652                    |
|                                 | APR-SEP         | 287                    | 432             | 530                             | 70       | 628                   | 773             | 755                    |
| CLARK FORK ab Missoula          | APR-JUL         | 689                    | 880             | 1010                            | 68       | 1140                  | 1331            | 1487                   |
|                                 | APR-SEP         | 796                    | 1007            | 1150                            | 68       | 1293                  | 1504            | 1681                   |

| UPPER CLARK FORK RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |      | UPPER CLARK FORK RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|--|-----------------|------------------------|-----------|------|---|----------------------|-------------------|---------|
| Reservoir  | Usable Capacity | *** Usable Storage *** |           |      | Watershed   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg  |   |                      | Last Yr           | Average |
| GEORGETOWN LAKE  | 31.0            | 27.5                   | 26.3      | 24.8 | CLARK FORK ab FLINT CRK   | 17                   | 62                | 80      |
| LOWER WILLOW CREEK   | 4.9             | 3.3                    | 1.6       | 2.3  | FLINT CREEK   | 7                    | 62                | 83      |
| NEVADA CREEK   | 12.6            | 10.1                   | 7.6       | 7.3  | ROCK CREEK  | 6                    | 58                | 82      |
|  |                 |                        |           |      | CLARK FORK ab BLACKFOOT   | 26                   | 60                | 80      |
|  |                 |                        |           |      | BLACKFOOT   | 17                   | 42                | 62      |
|  |                 |                        |           |      | UPPER CLARK FORK BASIN  | 40                   | 53                | 73      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

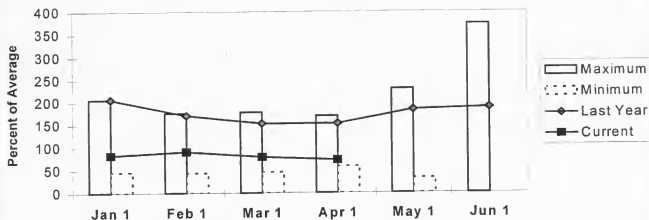
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
(2) - The value is natural volume - actual volume may be affected by upstream water management.

## Bitterroot River Basin

Snowpack conditions in the Bitterroot River Basin were below average and the fifth lowest of record, for the period 1961-1997. Snow water content was 28 percent below average and 53 percent below last year.

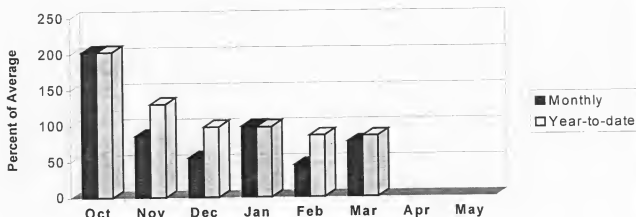
### Bitterroot Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe in 1977; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1977; May maximum swe was in 1972 and minimum swe was in 1987; and June maximum swe was 1972 and 1974 and minimum swe was in 1987 and 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 19 percent below average and 53 percent below last year. Valley precipitation during March was 59 percent below average and 60 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 15 percent below average and 43 percent below last year.

### Bitterroot Precipitation



Reservoir storage, on the last day of March, was 4 percent below average and 2 percent below last year. Painted Rocks Lake storage was 75 percent below average and 72 percent below last year and Como storage was 58 percent above average and 50 percent above last year.

Streamflows, for the period April through July, are forecast to be 27 percent below average and 51 percent below last years forecasts. Basin forecasts range from 28 percent below average to 22 percent below average.

Surface Water Supply Index (SWSI) was -2.1 in the Bitterroot River.

BITTERROOT RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                    | Forecast Period | <<===== Drier =====>> |          | Future Conditions               |          | ===== Wetter =====>> |          | 30-Yr Avg.<br>(1000AF) |
|-----------------------------------|-----------------|-----------------------|----------|---------------------------------|----------|----------------------|----------|------------------------|
|                                   |                 | 90%                   | 70%      | Chance Of Exceeding *           |          | 30%                  | 10%      |                        |
|                                   |                 | (1000AF)              | (1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | (1000AF)             | (1000AF) |                        |
| WF BITTERROOT nr Conner (2)       | APR-JUL         | 79                    | 99       | 112                             | 74       | 125                  | 145      | 152                    |
|                                   | APR-SEP         | 84                    | 106      | 120                             | 72       | 134                  | 156      | 166                    |
| BITTERROOT nr Darby               | APR-JUL         | 266                   | 322      | 360                             | 73       | 398                  | 454      | 491                    |
|                                   | APR-SEP         | 300                   | 356      | 395                             | 73       | 434                  | 490      | 540                    |
| ROCK CK nr Darby (2)              | APR-JUL         | 47                    | 54       | 59                              | 75       | 64                   | 72       | 79                     |
|                                   | APR-SEP         | 50                    | 57       | 62                              | 75       | 67                   | 75       | 83                     |
| SKALKABO CK nr Hamilton           | APR-JUL         | 26                    | 31       | 35                              | 76       | 39                   | 44       | 46                     |
|                                   | APR-SEP         | 30                    | 36       | 40                              | 76       | 44                   | 50       | 53                     |
| BURNT FORK CK nr Stevensville (2) | APR-JUL         | 15.0                  | 19.5     | 23                              | 78       | 26                   | 30       | 29                     |
|                                   | APR-SEP         | 17.1                  | 22       | 26                              | 77       | 30                   | 35       | 34                     |
| BITTERROOT at Missoula            | APR-JUL         | 729                   | 852      | 935                             | 72       | 1018                 | 1141     | 1301                   |
|                                   | APR-SEP         | 799                   | 931      | 1020                            | 72       | 1109                 | 1241     | 1418                   |

| BITTERROOT RIVER BASIN                     |                 |                        |           |      | BITTERROOT RIVER BASIN                      |                      |                   |         |
|--|-----------------|------------------------|-----------|------|---|----------------------|-------------------|---------|
| Reservoir Storage (1000 AF) - End of March |                 |                        |           |      | Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
| Reservoir                                  | Usable Capacity | *** Usable Storage *** |           |      | Watershed                                   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg  |   |                      | Last Yr           | Average |
| PAINTED ROCKS LAKE                         | 31.7            | 3.4                    | 12.1      | 13.6 | WEST FORK BITTERROOT                        | 3                    | 52                | 74      |
| COMO                                       | 34.9            | 24.5                   | 16.3      | 15.5 | EAST SIDE BITTERROOT                        | 6                    | 50                | 76      |
|  |                 |                        |           |      | WEST SIDE BITTERROOT                        | 4                    | 43                | 67      |
|  |                 |                        |           |      | BITTERROOT BASIN                            | 12                   | 47                | 71      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

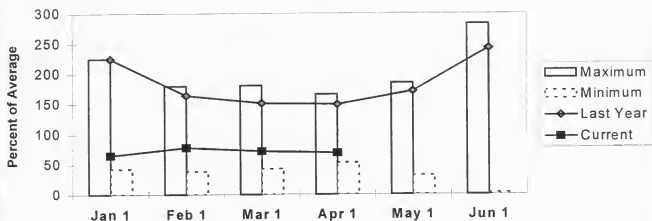
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural volume - actual volume may be affected by upstream water management.

## Lower Clark Fork River Basin

Snowpack conditions in the Lower Clark Fork River Basin were well below above average and fourth lowest of record, for the period 1961-1997. Snow water content was 31 percent below average and 54 percent below last year.

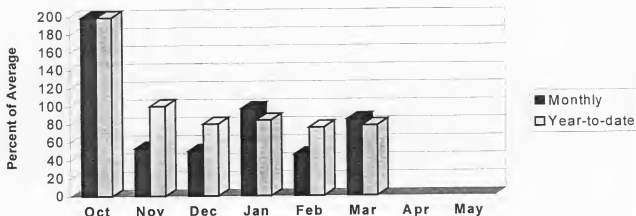
### Lower Clark Fork Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum swe was in 1981; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1977. Average is for the period 1961 through 1990.

Mountain precipitation during March was 17 percent below average and 51 percent below last year. Valley precipitation during March was 5 percent below average and 41 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 22 percent below average and 47 percent below last year.

### Lower Clark Fork Precipitation



Noxon Rapids storage, on the last day of March, was 41 percent above average and 8 percent above last year.

Streamflows, for the period April through July, are forecast to be 27 percent below average and 53 percent below last years forecasts. Basin forecasts range from 43 percent below average to 29 percent below average.

Surface Water Supply Index (SWSI) was -2.5 in the Clark Fork River below Bitterroot River and -2.5 in the Clark Fork River below Flathead River.

LOWER CLARK FORK RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                   | Forecast Period | <<----- Drier ----->> |          | Future Conditions   |    | Wetter ----->>> |          | 30-Yr Avg.<br>(1000AF) |
|----------------------------------|-----------------|-----------------------|----------|---------------------|----|-----------------|----------|------------------------|
|                                  |                 | 90%                   | 70%      | 50% (Most Probable) |    | 30%             | 10%      |                        |
|                                  |                 | (1000AF)              | (1000AF) | (1000AF) (% AVG.)   |    | (1000AF)        | (1000AF) |                        |
| CLARK FORK ab Missoula           | APR-JUL         | 689                   | 880      | 1010                | 68 | 1140            | 1331     | 1487                   |
|                                  | APR-SEP         | 796                   | 1007     | 1150                | 68 | 1293            | 1504     | 1681                   |
| CLARK FORK b1 Missoula           | APR-JUL         | 1461                  | 1752     | 1950                | 70 | 2148            | 2439     | 2788                   |
|                                  | APR-SEP         | 1632                  | 1952     | 2170                | 70 | 2388            | 2708     | 3099                   |
| CLARK FORK at St. Regis (1)      | APR-JUL         | 1586                  | 2249     | 2550                | 69 | 2851            | 3514     | 3686                   |
|                                  | APR-SEP         | 1779                  | 2516     | 2850                | 70 | 3184            | 3921     | 4095                   |
| CLARK FORK nr Plains (1,2)       | APR-JUL         | 5296                  | 6722     | 7370                | 71 | 8018            | 9444     | 10450                  |
|                                  | APR-SEP         | 5819                  | 7388     | 8100                | 71 | 8812            | 10381    | 11470                  |
| THOMPSON RIVER nr Thompson Falls | APR-JUL         | 75                    | 102      | 120                 | 56 | 138             | 165      | 214                    |
|                                  | APR-SEP         | 89                    | 118      | 137                 | 57 | 156             | 185      | 240                    |
| PROSPECT CREEK at Thompson Falls | APR-JUL         | 53                    | 63       | 70                  | 57 | 77              | 87       | 123                    |
|                                  | APR-SEP         | 57                    | 68       | 75                  | 57 | 82              | 93       | 132                    |
| CLARK FK at Whitehorse Rpd (1,2) | APR-JUL         | 5680                  | 7337     | 8090                | 69 | 8843            | 10500    | 11730                  |
|                                  | APR-SEP         | 6248                  | 8072     | 8900                | 69 | 9728            | 11552    | 12910                  |

| LOWER CLARK FORK RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |       | LOWER CLARK FORK RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|--|-----------------|------------------------|-----------|-------|---|----------------------|-------------------|---------|
| Reservoir  | Usable Capacity | *** Usable Storage *** |           |       | Watershed   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg   |   |                      | Last Yr           | Average |
| NOXON RAPIDS   | 335.0           | 326.4                  | 302.0     | 231.3 | LOWER CLARK FORK  | 14                   | 46                | 69      |
|  |                 |                        |           |       | CLARK FORK BASIN  | 53                   | 50                | 71      |
|  |                 |                        |           |       | CLARK FK ab PEND ORIELLE  | 103                  | 49                | 72      |
|  |                 |                        |           |       | COLUMBIA in MONTANA   | 114                  | 48                | 72      |
|  |                 |                        |           |       | COLUMBIA RIVER BASIN  | 141                  | 51                | 73      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

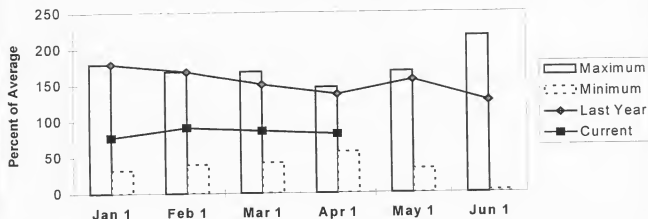
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.



## Jefferson River Basin

Snowpack conditions in the Jefferson River Basin were below average and seventh lowest of record, for the period 1961-1997. Snow water content was 19 percent below average and 40 percent below last year.

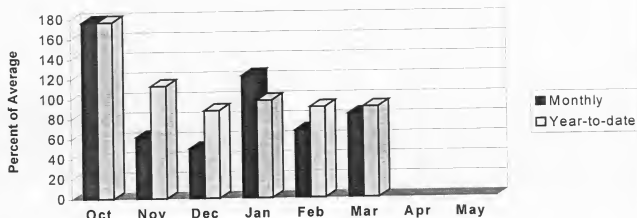
### Jefferson Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1997 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1977; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 17 percent below average and 15 percent below last year. Valley precipitation during March was 10 percent below average and 29 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 9 percent below average and 33 percent below last year.

### Jefferson Precipitation



Reservoir storage, on the last day of March, was 18 percent above average and 12 percent above last year. Lima storage was 41 percent above average and 4 percent below last year; Clark Canyon storage was 16 percent above average and 19 percent above last year; and Ruby River storage was 2 percent below average and 4 percent above last year.

Streamflows, for the period April through July, are forecast to be 16 percent below average and 46 percent below last years forecasts. Basin forecasts range from 23 percent below average to 10 percent below average.

Surface Water Supply Index (SWSI) was -1.4 in the Jefferson River; +0.2 in the Beaverhead River; -0.8 in the Ruby River; -1.9 in the Big Hole River; and -2.7 in the Boulder River.

JEFFERSON RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                       | Forecast Period | <<----- Drier ----->> |          | Future Conditions   |          | ----- Wetter ----->> |          | 30-Yr Avg.<br>(1000AF) |
|--------------------------------------|-----------------|-----------------------|----------|---------------------|----------|----------------------|----------|------------------------|
|                                      |                 | 90%                   | 70%      | 50% (Most Probable) |          | 30%                  | 10%      |                        |
|                                      |                 | (1000AF)              | (1000AF) | (1000AF)            | (% AVG.) | (1000AF)             | (1000AF) |                        |
| RED ROCK RIVER near Monida (2)       | APR-JUL         | 62                    | 73       | 80                  | 83       | 87                   | 98       | 97                     |
|                                      | APR-SEP         | 63                    | 77       | 86                  | 82       | 95                   | 109      | 105                    |
| BEAVERHEAD RIVER near Grant (2)      | APR-JUL         | 78                    | 100      | 115                 | 87       | 130                  | 152      | 132                    |
|                                      | APR-SEP         | 66                    | 105      | 132                 | 85       | 159                  | 198      | 155                    |
| BEAVERHEAD RIVER at Barretts (2)     | APR-JUL         | 115                   | 135      | 148                 | 86       | 161                  | 181      | 172                    |
|                                      | APR-SEP         | 136                   | 158      | 173                 | 85       | 188                  | 210      | 203                    |
| RUBY RIVER near Alder                | APR-JUL         | 47                    | 64       | 75                  | 90       | 87                   | 103      | 83                     |
|                                      | APR-SEP         | 57                    | 77       | 90                  | 91       | 104                  | 123      | 99                     |
| BIG HOLE RIVER near Melrose          | APR-JUL         | 317                   | 420      | 490                 | 76       | 560                  | 663      | 641                    |
|                                      | APR-SEP         | 346                   | 456      | 530                 | 76       | 604                  | 714      | 697                    |
| BOULDER RIVER near Boulder           | APR-JUL         | 45                    | 60       | 70                  | 82       | 80                   | 95       | 85                     |
|                                      | APR-SEP         | 50                    | 65       | 75                  | 82       | 85                   | 101      | 91                     |
| WILLOW CREEK near Harrison           | APR-JUL         | 5.8                   | 10.5     | 13.7                | 77       | 16.9                 | 22       | 17.7                   |
|                                      | APR-SEP         | 6.2                   | 11.7     | 15.4                | 77       | 19.1                 | 25       | 20                     |
| JEFFERSON RIVER near Three Forks (2) | APR-JUL         | 552                   | 712      | 820                 | 83       | 928                  | 1088     | 985                    |
|                                      | APR-SEP         | 557                   | 726      | 840                 | 83       | 954                  | 1123     | 1012                   |

| JEFFERSON RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |       | JEFFERSON RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|---|-----------------|------------------------|-----------|-------|--|----------------------|-------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |       | Watershed  | Number of Data Sites | This Year as % of |         |
|   |                 | This Year              | Last Year | Avg   |  |                      | Last Yr           | Average |
| LIMA  | 84.0            | 52.0                   | 54.2      | 36.9  | BEAVERHEAD   | 17                   | 66                | 89      |
| CLARK CANYON  | 255.6           | 178.2                  | 150.0     | 153.6 | RUBY   | 10                   | 68                | 85      |
| RUBY RIVER  | 38.8            | 30.7                   | 29.4      | 31.2  | BIGHOLE  | 21                   | 57                | 80      |
|   |                 |                        |           |       | BOULDER  | 9                    | 61                | 79      |
|   |                 |                        |           |       | JEFFERSON RIVER BASIN  | 47                   | 61                | 83      |

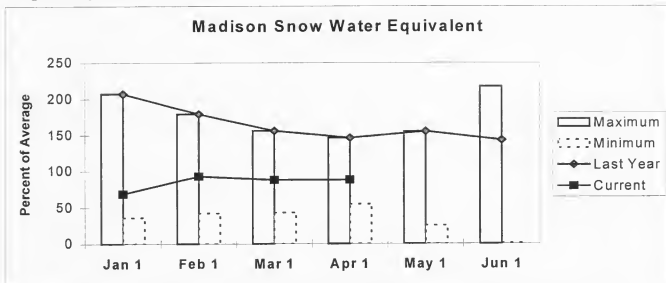
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

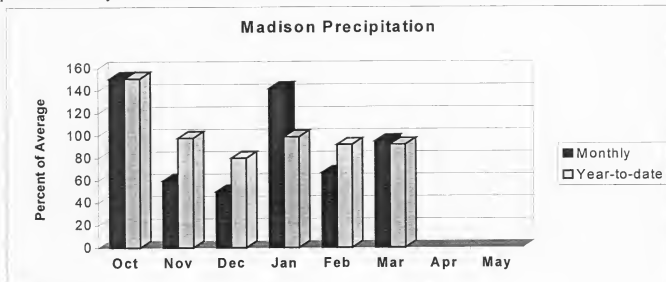
## Madison River Basin

Snowpack conditions in the Madison River Basin were below average. Snow water content was 12 percent below average and 40 percent below last year.



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1997 and minimum was in 1977; March maximum swe was in 1997 and minimum was in 1977; April maximum swe was in 1997 and minimum was in 1977; May maximum swe was in 1997 and minimum swe was in 1977; and June maximum swe was in 1995 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain and valley precipitation during March was 4 percent below average and 2 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 8 percent below average and 36 percent below last year.



Reservoir storage, on the last day of March, was 4 percent above average and 11 percent above last year. Ennis Lake storage was 11 percent below average and 5 percent above last year and Hebgen Lake storage was 6 percent above average and 12 percent above last year.

Streamflows, for the period April through July, are forecast to be 13 percent below average and 41 percent below last years forecasts. Basin forecasts range from 14 percent below average to 12 percent below average.

Surface Water Supply Index (SWSI) was +0.1 in the Madison River.

MADISON RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                    | Forecast Period | <----- Drier ----- Future Conditions ----- Wetter -----> |                 |  |                 |                 |                        |
|-----------------------------------|-----------------|--|-----------------|--|-----------------|-----------------|------------------------|
|                                   |                 | Chance Of Exceeding *                                    |                 |  |                 |                 | 30-Yr Avg.<br>(1000AF) |
|                                   |                 | 90%<br>(1000AF)  | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) (% AVG.) | 30%<br>(1000AF) | 10%<br>(1000AF) |                        |
| MADISON RIVER near Grayling (2)   | APR-JUL         | 272  | 303             | 325                                      | 86              | 347             | 378                    |
|                                   | APR-SEP         | 361  | 399             | 425                                      | 87              | 451             | 489                    |
| MADISON RIVER near McAllister (2) | APR-JUL         | 496  | 546             | 580                                      | 88              | 614             | 664                    |
|                                   | APR-SEP         | 643  | 698             | 735                                      | 88              | 772             | 827                    |
|                                   |                 |  |                 |  |                 |                 | 831                    |

| MADISON RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |       | MADISON RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|---|-----------------|------------------------|-----------|-------|--|----------------------|-------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |       | Watershed  | Number of Data Sites | This Year as % of |         |
|   |                 | This Year              | Last Year | Avg   |  |                      | Last Yr           | Average |
| ENNIS LAKE  | 41.0            | 29.6                   | 28.2      | 33.2  | MADISON abv HERGEN LAKE  | 6                    | 54                | 87      |
| HERGEN LAKE   | 377.5           | 262.4                  | 234.4     | 246.6 | MADISON blw HERGEN LAKE  | 11                   | 66                | 89      |
|   |                 |                        |           |       | MADISON RIVER BASIN  | 17                   | 60                | 88      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

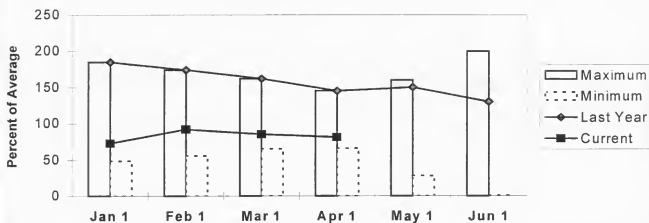
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

## Gallatin River Basin

Snowpack conditions in the Gallatin River Basin were below average and sixth lowest of record, for the period 1961-1997. Snow water content was 19 percent below average and 43 percent below last year.

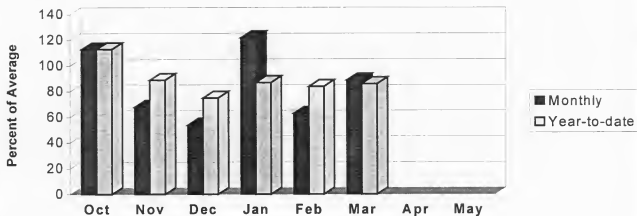
### Gallatin Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1966; February maximum swe was in 1997 and minimum was in 1981; March maximum swe was in 1997 and minimum was in 1977 and 1987; April maximum swe was in 1997 and minimum was in 1987; May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1975 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during March was 12 percent below average and 8 percent below last year. Valley precipitation during March was 27 percent above average and 30 percent above last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 14 percent below average and 40 percent below last year.

### Gallatin Precipitation



Middle Creek storage, on the last day of March, was 93 percent above average and 10 percent above last year.

Streamflows, for the period April through July, are forecast to be 13 percent below average and 42 percent below last years forecasts. Basin forecasts range from 15 percent below average to 11 percent below average.

Surface Water Supply Index (SWSI) was -1.4 in the Gallatin River.

GALLATIN RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                      | Forecast Period | <<----- Drier ----->> |          | Future Conditions               |          | ----- Wetter ----->> |          | 30-Yr Avg.<br>(1000AF) |
|-------------------------------------|-----------------|-----------------------|----------|---------------------------------|----------|----------------------|----------|------------------------|
|                                     |                 | 90%                   | 70%      | Chance Of Exceeding *           |          | 30%                  | 10%      |                        |
|                                     |                 | (1000AF)              | (1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | (1000AF)             | (1000AF) |                        |
| GALLATIN RIVER near Gateway         | APR-JUL         | 324                   | 363      | 390                             | 88       | 417                  | 456      | 441                    |
|                                     | APR-SEP         | 389                   | 431      | 460                             | 89       | 489                  | 531      | 518                    |
| E & W FK HYALITE CREEK near Bozeman | APR-JUL         | 15.6                  | 18.5     | 21                              | 89       | 23                   | 25       | 23                     |
|                                     | APR-SEP         | 18.4                  | 21       | 24                              | 90       | 26                   | 29       | 26                     |
| HYALITE CREEK nr Bozeman (2)        | APR-JUL         | 24                    | 29       | 32                              | 89       | 35                   | 41       | 36                     |
|                                     | APR-SEP         | 28                    | 33       | 37                              | 88       | 41                   | 46       | 42                     |
| GALLATIN RIVER at Logan (2)         | APR-JUL         | 288                   | 369      | 425                             | 85       | 481                  | 562      | 498                    |
|                                     | APR-SEP         | 357                   | 442      | 500                             | 86       | 558                  | 643      | 581                    |

| GALLATIN RIVER BASIN                       |                 |                        |           |     | GALLATIN RIVER BASIN                        |                      |                                   |         |
|--|-----------------|------------------------|-----------|-----|---|----------------------|-----------------------------------|---------|
| Reservoir Storage (1000 AF) - End of March |                 |                        |           |     | Watershed Snowpack Analysis - April 1, 1998 |                      |                                   |         |
| Reservoir                                  | Usable Capacity | *** Usable Storage *** |           |     | Watershed                                   | Number of Data Sites | This Year as % of Last Yr Average |         |
|  | Year            | This Year              | Last Year | Avg |   |                      | Last Yr                           | Average |
| MIDDLE CREEK                               | 10.2            | 7.9                    | 7.2       | 4.1 | UPPER GALLATIN                              | 7                    | 60                                | 85      |
|  |                 |                        |           |     | HYALITE                                     | 4                    | 59                                | 77      |
|  |                 |                        |           |     | BRIDGER                                     | 3                    | 48                                | 77      |
|  |                 |                        |           |     | GALLATIN RIVER BASIN                        | 14                   | 57                                | 81      |
|  |                 |                        |           |     | MISSOURI HEADWATERS                         | 71                   | 59                                | 83      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

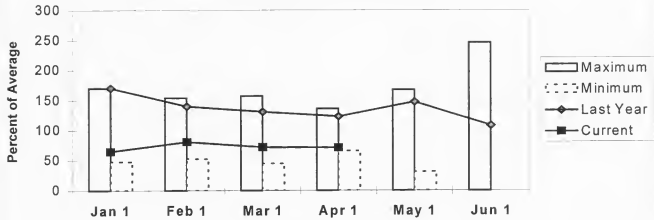
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

### Missouri Mainstem River Basin

Snowpack conditions in the Mainstem Missouri River Basin were well below average. Snow water content was in the Headwaters Mainstem was 29 percent below average, 42 percent below last year, and second lowest of record for the period 1961-1997; the Smith-Judith-Musselshell was 30 percent below average, 45 percent below last year, and third lowest of record for the period 1961-1997; and the Sun-Teton-Marias was 46 percent below average, 59 percent below last year, and tied for the lowest of record with 1984, for the period 1969-1997.

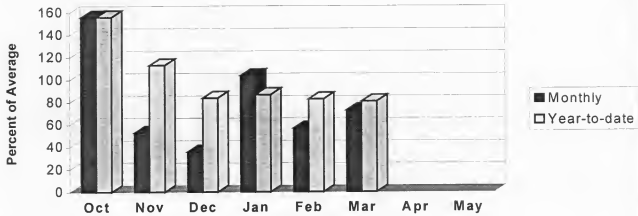
Headwaters Mainstem Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1961; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during March was 27 percent below average and 22 percent below last year. Valley precipitation during March was 29 percent below average and 5 percent below last year. Mountain and valley water year precipitation, beginning October 1, 1997, was 19 percent below average and 28 percent below last year.

Headwaters Mainstem Precipitation



Reservoir storage, on the last day of March, was 10 percent above average and 32 percent above last year. Canyon Ferry Lake storage was 10 percent above average and 37 percent above last year; Helena Valley storage was at average and 7 percent below last year; Lake Helena storage was 7 percent above average and the same as last year; Hauser & Helena storage was 3 percent above average and the same as last year; Holter Lake storage was 20 percent above average and the same as last year; and Fort Peck Lake storage was 2 percent above average and 3 percent below last year.

Streamflows, for the period April through July, are forecast to be 24 percent below average and 52 percent below last years forecasts. Basin forecasts range from 33 percent below average to 17 percent below average.

Surface Water Supply Index (SWSI) was -0.9 in the Missouri River above Canyon Ferry; -0.3 in the Missouri River below Canyon Ferry; -0.2 in the Missouri River above Ft. Peck; and 0.0 in the Missouri River below Ft. Peck.

MISSOURI MAINSTEM RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                     | Forecast Period | <<----- Drier ----->> |                 | Future Conditions               |          | ----- Wetter ----->> |                 | 30-Yr Avg.<br>(1000AF) |
|------------------------------------|-----------------|-----------------------|-----------------|---------------------------------|----------|----------------------|-----------------|------------------------|
|                                    |                 |                       |                 | Chance Of Exceeding *           |          |                      |                 |                        |
|                                    |                 | 90%<br>(1000AF)       | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | 30%<br>(1000AF)      | 10%<br>(1000AF) |                        |
| MISSOURI RIVER at Toston (2)       | APR-JUL         | 1024                  | 1439            | 1720                            | 83       | 2001                 | 2416            | 2075                   |
|                                    | APR-SEP         | 1474                  | 1706            | 2000                            | 83       | 2294                 | 2537            | 2416                   |
| PRICKLY PEAR CREEK near Clancy     | APR-JUL         | 3.1                   | 12.3            | 18.5                            | 80       | 25                   | 34              | 23                     |
|                                    | APR-SEP         | 4.1                   | 14.5            | 22                              | 80       | 29                   | 39              | 27                     |
| SUN RIVER at Gibson Dam (2)        | APR-JUL         | 148                   | 224             | 275                             | 58       | 326                  | 402             | 478                    |
|                                    | APR-SEP         | 176                   | 256             | 310                             | 59       | 364                  | 444             | 526                    |
| MISSOURI RIVER at Fort Benton (2)  | APR-JUL         | 1161                  | 1869            | 2350                            | 76       | 2831                 | 3539            | 3087                   |
|                                    | APR-SEP         | 1876                  | 2254            | 2780                            | 76       | 3306                 | 3788            | 3678                   |
| MARIAS RIVER near Shelby (2)       | APR-JUL         | 154                   | 241             | 300                             | 67       | 359                  | 446             | 447                    |
|                                    | APR-SEP         | 176                   | 265             | 325                             | 67       | 385                  | 474             | 487                    |
| MISSOURI RIVER at Virgelle (2)     | APR-JUL         | 1307                  | 2092            | 2625                            | 73       | 3158                 | 3943            | 3595                   |
|                                    | APR-SEP         | 2066                  | 2493            | 3090                            | 73       | 3687                 | 4512            | 4217                   |
| MISSOURI RIVER near Landusky (2)   | APR-JUL         | 1545                  | 2352            | 2900                            | 74       | 3448                 | 4255            | 3897                   |
|                                    | APR-SEP         | 2290                  | 2822            | 3410                            | 75       | 3998                 | 4992            | 4580                   |
| MISSOURI RIVER below Fort Peck (2) | APR-JUL         | 1542                  | 2321            | 2850                            | 71       | 3379                 | 4158            | 4015                   |
|                                    | APR-SEP         | 1855                  | 2698            | 3270                            | 73       | 3842                 | 4685            | 4467                   |
| LAKE SAKAKAWEA Inflow (2)          | APR-JUL         | 6148                  | 7319            | 8115                            | 82       | 8911                 | 10082           | 9897                   |
|                                    | APR-SEP         | 6581                  | 8367            | 9330                            | 82       | 10293                | 12594           | 11346                  |

| MISSOURI MAINSTEM RIVER BASIN              |                 |                        |           |        | MISSOURI MAINSTEM RIVER BASIN               |                      |                   |         |
|--|-----------------|------------------------|-----------|--------|---|----------------------|-------------------|---------|
| Reservoir Storage (1000 AF) - End of March |                 |                        |           |        | Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
| Reservoir                                  | Usable Capacity | *** Usable Storage *** |           |        | Watershed                                   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg    |   |                      | Last Yr           | Average |
| CANYON FERRY LAKE                          | 2043.0          | 1637.0                 | 1195.0    | 1489.0 | MISSOURI MAINSTEM                           | 10                   | 58                | 71      |
| HELENA VALLEY                              | 9.2             | 4.0                    | 4.3       | 4.0    | SMITH-JUDITH-MUSSELSHELL                    | 17                   | 55                | 70      |
| LAKE HELENA                                | 10.4            | 10.9                   | 10.9      | 10.2   | SUN-TETON-MARIAS                            | 14                   | 40                | 54      |
| HAUSER & HELENA                            | 61.9            | 63.1                   | 63.1      | 61.0   | MISSOURI abv FT PECK                        | 40                   | 49                | 63      |
| HOLTER LAKE                                | 81.9            | 80.8                   | 80.7      | 67.2   | MILK RIVER BASIN                            | 6                    | 83                | 47      |
| FORT PECK LAKE (HAF)                       | 18.9            | 15.2                   | 15.7      | 14.9   | MISSOURI MAINSTEM BASIN                     | 45                   | 50                | 63      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

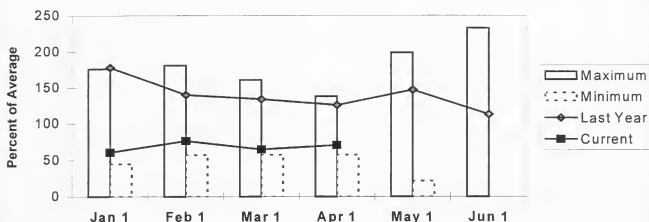
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.



## Smith-Judith-Musselshell River Basins

Snowpack conditions in the Smith-Judith-Musselshell River Basins were well below average and third lowest of record, for the period 1966-1997. Snow water content in the Smith River Basin was 25 percent below average and 43 percent below last year; the Judith River Basin was 32 percent below average and 40 percent below last year; and the Musselshell River Basin was 29 percent below average and 48 percent below last year.

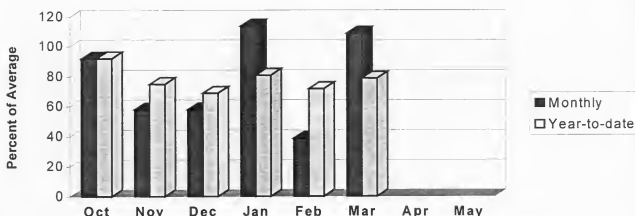
### Smith-Judith-Musselshell Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe in 1988; February maximum swe was in 1987; March maximum swe was in 1978 and minimum swe was in 1987; April maximum swe was in 1970 and minimum swe was in 1992; and May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain and valley precipitation for the combined basins was 9 percent above average and 11 percent above last year and the water year precipitation was 21 percent below average and 36 percent below last year. Smith River mountain and valley precipitation during March was 9 percent below average and 12 percent below last year and water year precipitation was 22 percent below average and 42 percent below last year; Judith River mountain and valley precipitation during March was 26 percent above average and 25 percent above last year and water year precipitation was 18 percent below average and 28 percent below last year; and the Musselshell River mountain and valley March precipitation was 39 percent above average and 55 percent above last year and the water year precipitation was 12 percent below average and 37 percent below last year.

### Smith-Judith-Musselshell Precipitation



Reservoir storage, on the last day of March, was 34 percent above average and 25 percent above last year. Smith River storage was 32 percent above average and 40 percent above last year; Newlan Creek storage was 16 percent above average and 19 percent above last year; Bair storage was 6 percent above average and 56 percent above last year; Martinsdale storage was 85 percent above average and 64 percent above last year; and Deadman's Basin was 30 percent above average and 15 percent above last year.

Streamflows, for the period April through July, are forecast to be 27 percent below average and 45 percent below last years forecasts. Basin forecast range from 37 percent below average to 12 percent below average.

Surface Water Supply Index (SWSI) was -2.2 in the Smith River and -0.2 in the Musselshell River.

SMITH-JUDITH-MUSSELSHELL RIVER BASINS  
Streamflow Forecasts - April 1, 1998

| Forecast Point                       | Forecast Period | <<----- Drier ----->> |                 | Future Conditions               |          | ----- Wetter ----->> |                 | 30-Yr Avg.<br>(1000AF) |
|--------------------------------------|-----------------|-----------------------|-----------------|---------------------------------|----------|----------------------|-----------------|------------------------|
|                                      |                 | Chance Of Exceeding * |                 |                                 |          |                      |                 |                        |
|                                      |                 | 90%<br>(1000AF)       | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | 30%<br>(1000AF)      | 10%<br>(1000AF) |                        |
| SHEEP CREEK nr White Sulphur Springs | APR-JUL         | 8.3                   | 10.8            | 12.5                            | 69       | 14.2                 | 16.7            | 18.1                   |
|                                      | APR-SEP         | 10.4                  | 13.1            | 15.0                            | 71       | 16.9                 | 19.6            | 21                     |
| SMITH RIVER blw Eagle Creek          | APR-JUL         | 49                    | 68              | 80                              | 78       | 92                   | 111             | 103                    |
|                                      | APR-SEP         | 61                    | 84              | 100                             | 81       | 116                  | 139             | 124                    |
| NF MUSSELSHELL near Delpine          | APR-JUL         | 0.84                  | 2.13            | 3.00                            | 63       | 3.87                 | 5.16            | 4.80                   |
|                                      | APR-SEP         | 1.08                  | 2.52            | 3.50                            | 63       | 4.48                 | 5.92            | 5.60                   |
| SF MUSSELSHELL abv Martinsdale       | APR-JUL         | 4.6                   | 22              | 34                              | 65       | 46                   | 63              | 52                     |
|                                      | APR-SEP         | 5.5                   | 24              | 36                              | 64       | 48                   | 67              | 56                     |

SMITH-JUDITH-MUSSELSHELL RIVER BASINS  
Reservoir Storage (1000 AF) - End of March

SMITH-JUDITH-MUSSELSHELL RIVER BASINS  
Watershed Snowpack Analysis - April 1, 1998

| Reservoir       | Usable Capacity | *** Usable Storage *** |           |      | Watershed                | Number of Data Sites | This Year as % of |         |
|-----------------|-----------------|------------------------|-----------|------|--------------------------|----------------------|-------------------|---------|
|                 |                 | This Year              | Last Year | Avg  |                          |                      | Last Yr           | Average |
| SMITH RIVER     | 10.6            | 9.8                    | 7.0       | 7.4  | SMITH                    | 7                    | 57                | 75      |
| NEWLAN CREEK    | 12.4            | 9.6                    | 8.1       | 8.3  | JUDITH                   | 9                    | 60                | 68      |
| BAIR            | 7.0             | 5.0                    | 3.2       | 4.7  | MUSSELSHELL              | 9                    | 53                | 71      |
| MARTINSDALE     | 23.1            | 17.9                   | 10.9      | 9.7  | SMITH-JUDITH-MUSSELSHELL | 17                   | 55                | 70      |
| DEADMAN'S BASIN | 72.2            | 65.0                   | 56.3      | 50.1 |                          |                      |                   |         |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

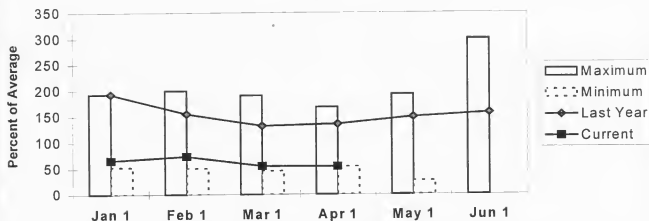
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
(2) - The value is natural volume - actual volume may be affected by upstream water management.

## Sun-Teton-Marias River Basins

Snowpack conditions in the Sun-Teton-Marias River Basins were well below average and tied for the lowest of record, for the period 1969-1997. Snow water content in the Sun River Basin was 47 percent below average and 62 percent below last year; the Teton River Basin was 48 percent below average and 59 percent below last year; and the Marias River Basin was 46 percent below average and 59 percent below last year.

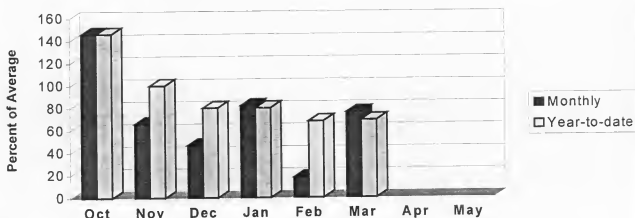
### Sun-Teton-Marias Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1984; April maximum swe was in 1972 and minimum swe was in 1984; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Combined mountain and valley precipitation for the three basins during March was 24 percent below average and 42 percent below last year with the water year precipitation, beginning October 1, 1997, 31 percent below average and 46 percent below last year. Mountain and valley precipitation in the Sun River was 15 percent below average and 26 percent below last year with the water year precipitation 29 percent below average and 40 percent below last year; in the Teton River was 35 percent below average and 53 percent below last year with the water year precipitation 30 percent below average and 43 percent below last year; and in the Marias River was 21 percent below average and 41 percent below last year with the water year precipitation 32 percent below average and 48 percent below last year.

### Sun-Teton-Marias Precipitation



Reservoir storage, on the last day of March, was 21 percent above average and 1 percent above last year. Gibson storage was 4 percent below average and 35 percent above last year; Pishkun storage was 108 percent above average and 1 percent above last year; Willow Creek storage was 31 percent above average and 202 percent above last year; Lower Two Medicine Lake storage was 59 percent above average and 198 percent above last year; Four Horns Lake storage was 13 percent below average and 11 percent below last year; Swift storage was 8 percent above average and 40 percent above last year; Lake Frances storage was 4 percent above average and 4 percent below last year; and Lake Elwell (Tiber) storage was 26 percent above average and 4 percent below last year.

Streamflows, for the period April through July, are forecast to be 38 percent below average and 55 percent below last years forecasts. Basin forecasts range from 42 percent below average to 33 percent below average.

Surface Water Supply Index (SWSI) was -2.9 the Sun River; -3.4 in the Teton River; -2.9 in the Marias River; and -2.4 in the Birch/Dupuyer Creeks.

SUN-TETON-MARIAS RIVER BASINS  
Streamflow Forecasts - April 1, 1998

| Forecast Point                       | Forecast Period | <<----- Drier ----->> |                 | Future Conditions               |          | ----- Wetter ----->> |                 | 30-Yr Avg.<br>(1000AF) |
|--------------------------------------|-----------------|-----------------------|-----------------|---------------------------------|----------|----------------------|-----------------|------------------------|
|                                      |                 | 90%<br>(1000AF)       | 70%<br>(1000AF) | Chance Of Exceeding *           |          | 30%<br>(1000AF)      | 10%<br>(1000AF) |                        |
|                                      |                 |                       |                 | 50% (Most Probable)<br>(1000AF) | (% AVG.) |                      |                 |                        |
| SUN RIVER at Gibson Dam (2)          | APR-JUL         | 148                   | 224             | 275                             | 58       | 326                  | 402             | 478                    |
|                                      | APR-SEP         | 176                   | 256             | 310                             | 59       | 364                  | 444             | 526                    |
| TWO MEDICINE RIVER near Browning (2) | APR-JUL         | 61                    | 102             | 130                             | 61       | 158                  | 199             | 215                    |
|                                      | APR-SEP         | 72                    | 112             | 140                             | 61       | 168                  | 208             | 228                    |
| BADGER CREEK near Browning (2)       | APR-JUL         | 33                    | 52              | 65                              | 63       | 78                   | 97              | 104                    |
|                                      | APR-SEP         | 43                    | 64              | 78                              | 65       | 92                   | 113             | 120                    |
| SWIFT RESERVOIR Inflow near Dupuyer  | APR-JUL         | 21                    | 35              | 44                              | 65       | 54                   | 68              | 68                     |
|                                      | APR-SEP         | 29                    | 43              | 53                              | 66       | 63                   | 78              | 80                     |
| DUPUYER CREEK near Valier            | APR-JUL         | 1.5                   | 4.4             | 10.6                            | 68       | 16.8                 | 26              | 15.5                   |
|                                      | APR-SEP         | 1.7                   | 5.0             | 11.7                            | 67       | 18.4                 | 28              | 17.4                   |
| CUT BANK CREEK at Cut Bank           | APR-JUL         | 34                    | 48              | 57                              | 66       | 66                   | 80              | 87                     |
|                                      | APR-SEP         | 39                    | 53              | 63                              | 66       | 73                   | 87              | 96                     |
| MARIAS RIVER near Shelby (2)         | APR-JUL         | 154                   | 241             | 300                             | 67       | 359                  | 446             | 447                    |
|                                      | APR-SEP         | 176                   | 265             | 325                             | 67       | 385                  | 474             | 487                    |

| SUN-TETON-MARIAS RIVER BASINS<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |       | SUN-TETON-MARIAS RIVER BASINS<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|---|-----------------|------------------------|-----------|-------|--|----------------------|-------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |       | Watershed  | Number of Data Sites | This Year as % of |         |
|   |                 | This Year              | Last Year | Avg   |  |                      | Last Yr           | Average |
| GIBSON  | 99.1            | 48.4                   | 35.8      | 50.5  | SUN  | 7                    | 38                | 53      |
| PISHKUN   | 32.0            | 19.2                   | 19.1      | 17.8  | TETON  | 4                    | 41                | 52      |
| WILLOW CREEK  | 32.2            | 29.9                   | 9.9       | 22.8  | MARIAS   | 6                    | 41                | 54      |
| LOWER TWO MEDICINE LAKE   | 11.9            | 11.9                   | 4.0       | 7.5   | SUN-TETON-MARIAS   | 14                   | 40                | 54      |
| FOUR HORNS LAKE   | 19.2            | 10.9                   | 12.3      | 12.5  |  |                      |                   |         |
| SWIFT   | 30.0            | 18.6                   | 13.3      | 17.2  |  |                      |                   |         |
| LAKE FRANCES  | 112.0           | 74.5                   | 77.3      | 71.6  |  |                      |                   |         |
| LAKE ELMELL (TIBER)   | 1347.0          | 753.2                  | 782.4     | 596.7 |  |                      |                   |         |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

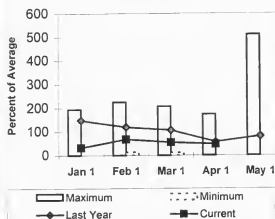
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

# St. Mary and Milk River Basins

Snowpack conditions in the St. Mary River and Milk River Basins were below average. Snow water content in the St. Mary River Basin was 20 percent below average, 46 percent below last year and seventh lowest of record, for the period 1961-1997. The Bearpaw Mountains were 53 percent below average, 18 percent below last year, and sixth lowest of record, for the period 1973 through 1997.

**Bearpaw Mountains Snow Water Equivalent**

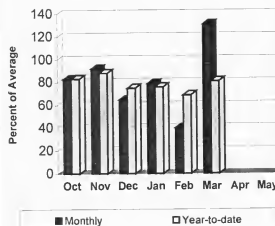


Bearpaw - January maximum swe was established in 1978 and minimum swe was in 1981; February maximum swe was 1978 and minimum was in 1973; March maximum swe was 1978 and minimum swe was 1981; April maximum swe was in 1975 and minimum swe was in 1983; May maximum swe was 1975 and the minimum has occurred in several years. Average is for the period 1961 through 1990.

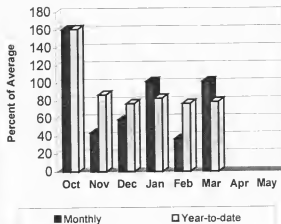
St. Mary - January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1992; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1991 and minimum swe was 1992. Average is for the period 1961 through 1990.

Combined Mountain and valley precipitation during March was 13 percent above average and 1 percent below last year with the water year precipitation, beginning October 1, 1997, 20 percent below average and 30 percent below last year. Mountain and Valley precipitation in the St. Mary River was 2 percent above average and 28 percent below last year with the water year precipitation, beginning October 1, 1997, 21 percent below average and 37 percent below last year. The Milk River was 31 percent above average and 80 percent above last year with the water year precipitation, beginning October 1, 1997, 19 percent below average and 13 percent below last year.

**Milk Precipitation**



**St. Mary Precipitation**



Reservoir storage, on the last day of March, was 10 percent below average and 29 percent below last year. Lake Sherburne storage was 8 percent below average and 28 percent below last year; Fresno storage was 29 percent below average and 49 percent below last year; Beaver Creek storage was 18 percent above average and 26 percent below last year; and Nelson storage was 26 percent above average and 32 percent above last year.

Streamflows in the St. Mary, for the period April through July, are forecast to be 22 percent below average and 39 percent below last years forecasts. Streamflow in the Milk, for the period April through July, are forecast to be 44 percent below average and 58 percent below last years forecasts.

Surface Water Supply Index (SWSI) was -2.8 in the Milk River.

**ST. MARY and MILK RIVER BASINS**  
**Streamflow Forecasts - April 1, 1998**

| Forecast Point                      | Forecast Period | <<----- Drier ----->> |          | Future Conditions               |          | ----- Wetter ----->> |          | 30-Yr Avg.<br>(1000AF) |
|-------------------------------------|-----------------|-----------------------|----------|---------------------------------|----------|----------------------|----------|------------------------|
|                                     |                 | 90%                   | 70%      | Chance Of Exceeding *           |          | 30%                  | 10%      |                        |
|                                     |                 | (1000AF)              | (1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | (1000AF)             | (1000AF) |                        |
| SWIFTCURRENT CREEK at Sherburne (2) | APR-JUL         | 71                    | 79       | 85                              | 79       | 91                   | 99       | 107                    |
|                                     | APR-SEP         | 84                    | 94       | 100                             | 80       | 106                  | 116      | 125                    |
| ST. MARY RIVER near Babb            | APR-JUL         | 255                   | 285      | 305                             | 77       | 325                  | 355      | 395                    |
|                                     | APR-SEP         | 289                   | 325      | 350                             | 76       | 375                  | 411      | 463                    |
| ST. MARY RIVER at US/CAN Border (2) | APR-JUL         | 286                   | 330      | 360                             | 78       | 390                  | 434      | 462                    |
|                                     | APR-SEP         | 342                   | 391      | 425                             | 79       | 459                  | 508      | 539                    |
| MILK RIVER at Western Crossing      | APR-JUL         | 9.0                   | 16.7     | 22                              | 60       | 27                   | 35       | 37                     |
|                                     | APR-SEP         | 10.0                  | 17.7     | 23                              | 59       | 28                   | 36       | 39                     |
| MILK RIVER at Eastern Crossing (2)  | APR-JUL         | 5.7                   | 22       | 33                              | 57       | 44                   | 60       | 58                     |
|                                     | APR-SEP         | 12.8                  | 28       | 38                              | 57       | 48                   | 63       | 67                     |
| BEAVER CREEK near Havre             | APR-JUL         | 0.00                  | 0.21     | 3.00                            | 32       | 5.79                 | 9.89     | 9.50                   |

| ST. MARY and MILK RIVER BASINS<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |      | ST. MARY and MILK RIVER BASINS<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|--|-----------------|------------------------|-----------|------|---|----------------------|-------------------|---------|
| Reservoir  | Usable Capacity | *** Usable Storage *** |           |      | Watershed   | Number of Data Sites | This Year as % of |         |
|  |                 | This Year              | Last Year | Avg  |   |                      | Last Yr           | Average |
| LAKE SHERBURNE   | 64.3            | 22.8                   | 31.5      | 24.8 | ST. MARY  | 3                    | 54                | 80      |
| FRESNO   | 127.0           | 55.1                   | 108.6     | 77.1 | BEARPAW MOUNTAINS   | 6                    | 83                | 47      |
| BEAVER CREEK   | 3.5             | 2.6                    | 3.5       | 2.2  | CYPRESS HILLS, CANADA   | 0                    | 0                 | 0       |
| NELSON   | 66.8            | 45.9                   | 34.9      | 36.5 | MILK RIVER BASIN  | 6                    | 83                | 47      |
|  |                 |                        |           |      | ST. MARY & MILK BASINS  | 9                    | 57                | 73      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

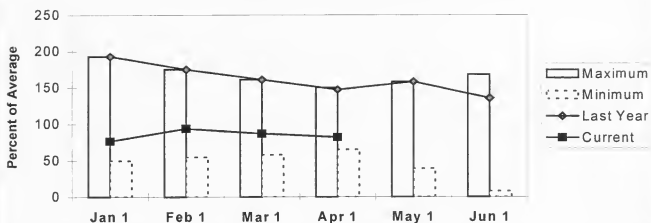
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
(2) - The value is natural volume - actual volume may be affected by upstream water management.

## Upper Yellowstone River Basin

Snowpack conditions in the Upper Yellowstone River Basin were below average and sixth lowest of record, for the period 1961-1997. Snow water content was 18 percent below average and 44 percent below last year.

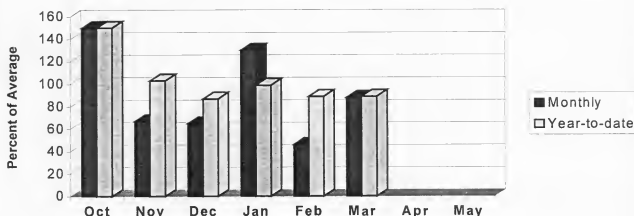
### Upper Yellowstone Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1997 and minimum swe was in 1977; March maximum swe was in 1997 and minimum swe was in 1977; April maximum swe was in 1971 and minimum swe was in 1981; May maximum swe was in 1997 and minimum swe was in 1987; and June maximum swe was 1982 and minimum swe was in 1987 and 1994. Average is for the period 1961 through 1990.

Snowpack conditions in the Upper Yellowstone River Basin were below average and sixth lowest of record, for the period 1961-1997. Snow water content was 18 percent below average and 44 percent below last year.

### Upper Yellowstone Precipitation



Reservoir storage, on the last day of March, was 19 percent above average and 22 percent above last year. Mystic Lake storage was 55 percent below average and 367 percent above last year and Cooney storage was 32 percent above average and 16 percent above last year.

Streamflows, for the period April through July, are forecast to be 18 percent below average and 46 percent below last years forecasts. Basin forecasts range from 23 percent below average to 13 percent below average.

Surface Water Supply Index (SWSI) was -1.6 in the Yellowstone River above Bighorn River; -1.4 in the Yellowstone River above Livingston; -1.8 in the Shields River; -1.8 in the Boulder River; -2.2 in the Stillwater River; -1.7 in the Rock/Red Lodge Creeks; and -1.9 in the Clarks Fork River.

UPPER YELLOWSTONE RIVER BASIN  
Streamflow Forecasts - April 1, 1998

| Forecast Point                      | Forecast Period | << Drier >>           |                 | Future Conditions               |          | >> Wetter >>    |                 | 30-Yr Avg.<br>(1000AF) |
|-------------------------------------|-----------------|-----------------------|-----------------|---------------------------------|----------|-----------------|-----------------|------------------------|
|                                     |                 | Chance Of Exceeding * |                 |                                 |          |                 |                 |                        |
|                                     |                 | 90%<br>(1000AF)       | 70%<br>(1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | 30%<br>(1000AF) | 10%<br>(1000AF) |                        |
| YELLOWSTONE at Lake Outlet          | APR-JUL         | 405                   | 462             | 500                             | 87       | 538             | 595             | 573                    |
|                                     | APR-SEP         | 566                   | 640             | 690                             | 87       | 740             | 814             | 792                    |
| YELLOWSTONE RIVER at Corwin Springs | APR-JUL         | 1161                  | 1256            | 1320                            | 82       | 1384            | 1479            | 1609                   |
|                                     | APR-SEP         | 1376                  | 1503            | 1590                            | 82       | 1677            | 1804            | 1937                   |
| YELLOWSTONE RIVER near Livingston   | APR-JUL         | 1326                  | 1444            | 1525                            | 82       | 1606            | 1724            | 1855                   |
|                                     | APR-SEP         | 1596                  | 1741            | 1840                            | 82       | 1939            | 2084            | 2241                   |
| SHIELDS RIVER near Livingston       | APR-JUL         | 84                    | 108             | 125                             | 77       | 142             | 166             | 162                    |
|                                     | APR-SEP         | 96                    | 121             | 138                             | 77       | 155             | 180             | 179                    |
| BOULDER RIVER at Big Timber         | APR-JUL         | 206                   | 247             | 275                             | 82       | 303             | 344             | 335                    |
|                                     | APR-SEP         | 230                   | 272             | 300                             | 82       | 328             | 370             | 364                    |
| WEST ROSEBUD CREEK near Roscoe (2)  | APR-JUL         | 42                    | 48              | 52                              | 85       | 56              | 62              | 61                     |
|                                     | APR-SEP         | 55                    | 62              | 67                              | 85       | 72              | 79              | 79                     |
| STILLWATER RIVER nr Absarokee (2)   | APR-JUL         | 316                   | 384             | 430                             | 86       | 476             | 544             | 498                    |
|                                     | APR-SEP         | 401                   | 466             | 510                             | 86       | 554             | 619             | 593                    |
| CLARKS FORK RIVER near Belfry       | APR-JUL         | 350                   | 404             | 440                             | 83       | 476             | 530             | 532                    |
|                                     | APR-SEP         | 385                   | 444             | 485                             | 82       | 526             | 585             | 590                    |
| COONEY RESERVOIR INFLOW (2)         | APR-JUL         | 9.7                   | 25              | 36                              | 77       | 47              | 62              | 47                     |
|                                     | APR-SEP         | 18.1                  | 34              | 44                              | 77       | 55              | 70              | 57                     |
| YELLOWSTONE RIVER at Billings (2)   | APR-JUL         | 2181                  | 2624            | 2925                            | 82       | 3226            | 3669            | 3577                   |
|                                     | APR-SEP         | 2948                  | 3174            | 3500                            | 83       | 3826            | 4043            | 4211                   |

| UPPER YELLOWSTONE RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |      | UPPER YELLOWSTONE RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|---|-----------------|------------------------|-----------|------|--|----------------------|-------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |      | Watershed  | Number of Data Sites | This Year as % of |         |
|   |                 | This Year              | Last Year | Avg  |  |                      | Last Yr           | Average |
| MYSTIC LAKE   | 21.0            | 1.4                    | 0.3       | 3.1  | YELLOWSTONE ab LIVINGSTON  | 18                   | 57                | 88      |
| COONEY  | 27.4            | 22.3                   | 19.2      | 16.9 | SHIELDS  | 7                    | 47                | 76      |
|   |                 |                        |           |      | BOULDER-STILLWATER   | 7                    | 55                | 71      |
|   |                 |                        |           |      | CLARK'S FORK-ROCK CREEK  | 13                   | 58                | 82      |
|   |                 |                        |           |      | UPPER YELLOWSTONE RIVER  | 41                   | 56                | 82      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

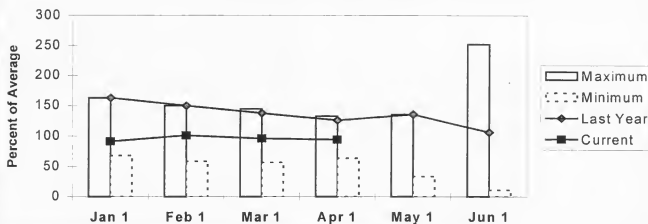
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.



## Lower Yellowstone River Basin

Snowpack conditions in the Lower Yellowstone River Basin were near average. Snow water content was 6 percent below average and 28 percent below last year.

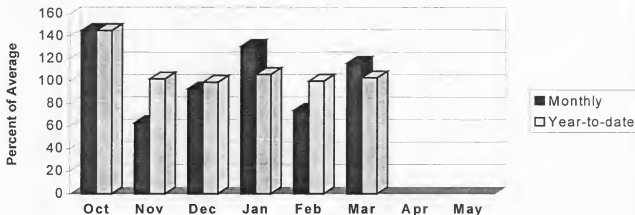
### Lower Yellowstone Snow Water Equivalent



January maximum swe was established in 1997 and minimum swe was in 1981; February maximum swe was in 1997 and minimum swe was in 1981; March maximum swe was in 1986 and minimum swe was in 1977; April maximum swe was in 1986 and minimum swe was in 1981; May maximum swe was in 1997 and minimum swe was in 1981; and June maximum swe was in 1995 and minimum swe was in 1994. Average is for the period 1961 through 1990.

Mountain and valley precipitation during March was 16 percent above average and 25 percent above last year. Water year precipitation, beginning October 1, 1997, was 3 percent above average and 20 percent below last year.

### Lower Yellowstone Precipitation



Reservoir storage, on the last day of March, was 4 percent above average and 11 percent above last year. Bighorn Lake storage was 8 percent above average and 13 percent above last year and Tongue River was 74 percent below average and 63 percent below last year. The Tongue reservoir storage is low due to construction work at the dam.

Streamflows, for the period April through July, are forecast to be 13 percent below average and 45 percent below last years forecasts. Basin forecasts range from 27 percent below average to 4 percent below average.

Surface Water Supply Index (SWSI) was -0.4 in the Yellowstone River below Bighorn River; +0.9 in the Bighorn River below Bighorn Lake; -0.9 in the Little Bighorn River; +1.5 in the Tongue River; and -0.6 in the Powder River.

LOWER YELLOWSTONE RIVER BASIN  
Streamflow Forecasts - April 1, 1998

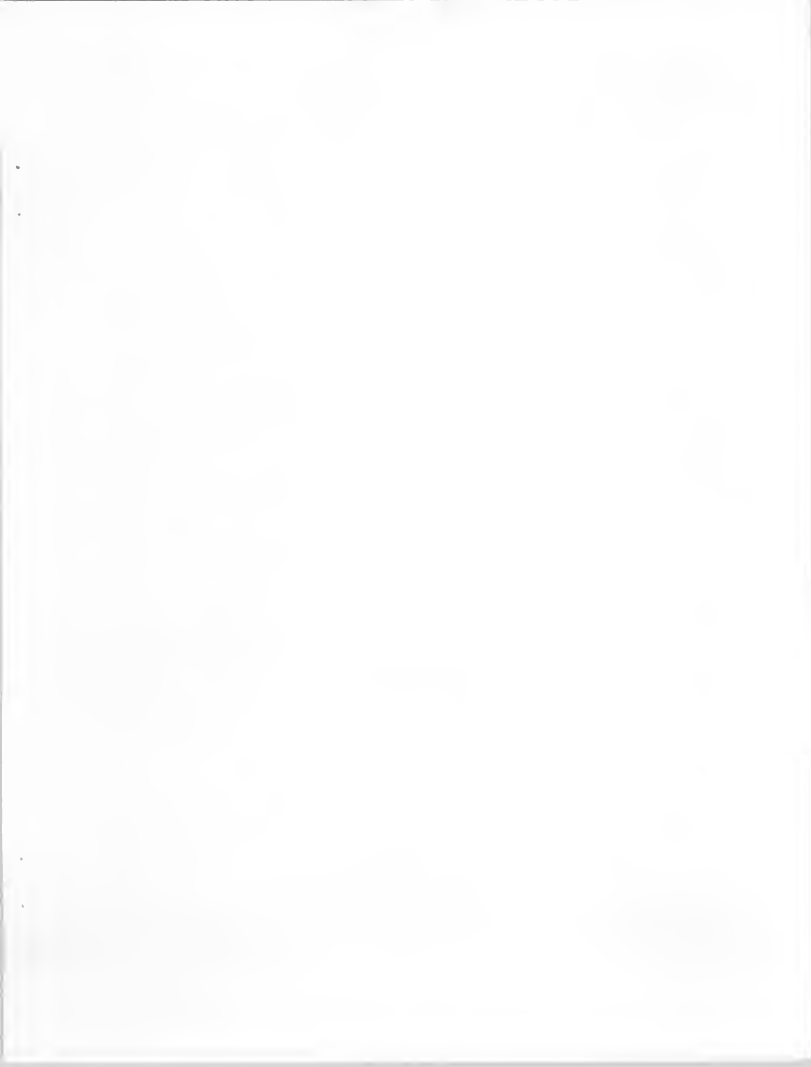
| Forecast Point                       | Forecast Period | <<===== Drier =====>> |          | Future Conditions               |          | ===== Wetter =====>> |          | 30-Yr Avg.<br>(1000AF) |
|--------------------------------------|-----------------|-----------------------|----------|---------------------------------|----------|----------------------|----------|------------------------|
|                                      |                 | 90%                   | 70%      | Chance Of Exceeding *           |          | 30%                  | 10%      |                        |
|                                      |                 | (1000AF)              | (1000AF) | 50% (Most Probable)<br>(1000AF) | (% AVG.) | (1000AF)             | (1000AF) |                        |
| YELLOWSTONE RIVER at Billings (2)    | APR-JUL         | 2181                  | 2624     | 2925                            | 82       | 3226                 | 3669     | 3577                   |
|                                      | APR-SEP         | 2948                  | 3174     | 3500                            | 83       | 3826                 | 4043     | 4211                   |
| BIGHORN RIVER nr St. Xavier (2)      | APR-JUL         | 1133                  | 1396     | 1575                            | 96       | 1754                 | 2017     | 1645                   |
|                                      | APR-SEP         | 1220                  | 1556     | 1740                            | 97       | 1924                 | 2260     | 1794                   |
| LITTLE BIGHORN RIVER nr Hardin       | APR-JUL         | 58                    | 98       | 125                             | 89       | 152                  | 192      | 140                    |
|                                      | APR-SEP         | 63                    | 109      | 140                             | 89       | 171                  | 217      | 157                    |
| TONGUE RIVER stateline nr Decker (2) | APR-JUL         | 141                   | 185      | 215                             | 94       | 245                  | 289      | 230                    |
|                                      | APR-SEP         | 163                   | 209      | 240                             | 94       | 271                  | 317      | 256                    |
| YELLOWSTONE RIVER at Miles City (2)  | APR-JUL         | 3360                  | 4173     | 4725                            | 87       | 5277                 | 6090     | 5431                   |
|                                      | APR-SEP         | 4208                  | 4877     | 5460                            | 87       | 6043                 | 6721     | 6281                   |
| POWDER RIVER at Moorhead             | APR-JUL         | 78                    | 127      | 160                             | 76       | 193                  | 242      | 211                    |
|                                      | APR-SEP         | 100                   | 145      | 175                             | 75       | 205                  | 250      | 232                    |
| POWDER RIVER near Locate             | APR-JUL         | 94                    | 148      | 185                             | 73       | 222                  | 276      | 252                    |
|                                      | APR-SEP         | 93                    | 157      | 200                             | 73       | 243                  | 307      | 276                    |
| YELLOWSTONE RIVER nr Sidney (2)      | APR-JUL         | 3258                  | 4355     | 5100                            | 86       | 5845                 | 6942     | 5925                   |
|                                      | APR-SEP         | 4293                  | 5032     | 5880                            | 86       | 6728                 | 7427     | 6814                   |

| LOWER YELLOWSTONE RIVER BASIN<br>Reservoir Storage (1000 AF) - End of March |                 |                        |           |       | LOWER YELLOWSTONE RIVER BASIN<br>Watershed Snowpack Analysis - April 1, 1998 |                      |                   |         |
|---|-----------------|------------------------|-----------|-------|--|----------------------|-------------------|---------|
| Reservoir   | Usable Capacity | *** Usable Storage *** |           |       | Watershed  | Number of Data Sites | This Year as % of |         |
|   |                 | This Year              | Last Year | Avg   |  |                      | Last Yr           | Average |
| BIGHORN LAKE  | 1356.0          | 860.4                  | 761.0     | 798.5 | WIND RIVER (Wyoming)   | 20                   | 71                | 97      |
| TONGUE RIVER  | 68.0            | 9.5                    | 25.5      | 36.1  | SHOSHONE RIVER (Wyoming)   | 7                    | 61                | 91      |
|   |                 |                        |           |       | BIGHORN RIVER (Wyoming)  | 21                   | 71                | 94      |
|   |                 |                        |           |       | LITTLE BIGHORN (Wyoming)   | 3                    | 82                | 90      |
|   |                 |                        |           |       | TONGUE RIVER (Wyoming)   | 9                    | 81                | 90      |
|   |                 |                        |           |       | POWDER RIVER (Wyoming)   | 9                    | 80                | 94      |
|   |                 |                        |           |       | LOWER YELLOWSTONE RIVER  | 49                   | 73                | 94      |
|   |                 |                        |           |       | YELLOWSTONE BASIN  | 85                   | 63                | 87      |

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.





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